Description

Process for preparing acylurea derivatives, salts of these acylurea derivatives and their use as pesticides

The invention relates to a process for preparing acylurea derivatives, to salts of acylurea derivatives obtainable by this process, to compositions containing them, and to the use thereof as pesticides.

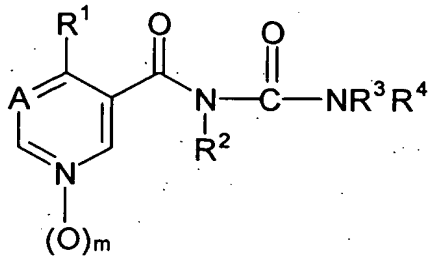
Insecticidal acylurea derivatives are proposed in WO 2003/097604.

These compounds are prepared by reacting the appropriate carboxamide with oxalyl chloride to give the isocyanate and further reaction thereof with an amine to give the N-acylurea derivative. Formation of the isocyanate is possible only by reacting the amide with oxalyl chloride, but not with phosgene, leading to high process costs.

It was therefore an object to provide a novel advantageous synthesis of acylurea derivatives.

It has now surprisingly been found that reaction of 4-haloalkylpyri(mi)dine-carboxamides with carbamates or similarly reactive compounds leads in a simple manner to N'-[4-haloalkylpyri(mi)dinyl]carbonylureas in very good yields and high purity.

The invention therefore relates to a process for preparing N-disubstituted-N'-[4-haloalkylpyri(mi)dinyl]carbonylureas of the formula (I),



(I)

where

A is CH or N;

R^1 is (C_1-C_4)-haloalkyl;

R^2 is H or M;

M is an organic or inorganic cation;

R^3 is (C_1-C_8)-alkyl, (C_3-C_6)-alkenyl, (C_3-C_6)-alkynyl, (C_1-C_8)-alkoxy, (C_3-C_6)-alkenyloxy, (C_3-C_6)-alkynyloxy, (C_3-C_8)-cycloalkyl, (C_3-C_8)-cycloalkyl-(C_1-C_6)-alkyl, O-CH_2-(C_3-C_8)-cycloalkyl, where the last nine groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, aryloxy, heterocyclyloxy, -CH_2-aryl, -O-CH_2-aryl, -CH_2-heterocyclyl, -O-CH_2-heterocyclyl, where the last eight radicals mentioned are unsubstituted or substituted by one or more R^6 radicals;

R^4 is (C_1-C_8)-alkyl, (C_3-C_6)-alkenyl, (C_3-C_6)-alkynyl, (C_3-C_8)-cycloalkyl, (C_3-C_8)-cycloalkyl-(C_1-C_6)-alkyl, where the last five groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, -CH_2-aryl, -CH_2-heterocyclyl, where the last four groups mentioned are unsubstituted or substituted by one or more R^6 radicals;

or

R^3 and R^4 together with the adjacent N atom form a 3 - 8 membered saturated,

unsaturated or aromatic heterocyclic ring which optionally comprises up to three further heteroatoms from the group of N, S and O and which is unsubstituted or substituted by one or more $(C_1\text{-}C_6)$-alkyl, $(C_1\text{-}C_6)$-haloalkyl or R^5 radicals;

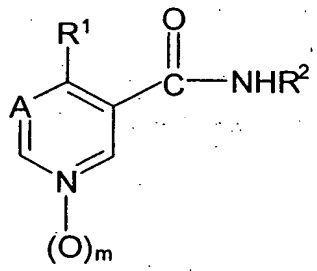
R^5 is halogen, $(C_1\text{-}C_6)$-alkoxy, $(C_1\text{-}C_6)$-haloalkoxy, $S(O)_n\text{-}(C_1\text{-}C_6)$-alkyl, $S(O)_n\text{-}(C_1\text{-}C_6)$-haloalkyl, CN, $COO(C_1\text{-}C_6)$-alkyl, NO_2, $N[(C_1\text{-}C_6)\text{-alkyl}]_2$, phenoxy, unsubstituted or substituted by one or more radicals from the group of $(C_1\text{-}C_6)$-alkyl, $(C_1\text{-}C_6)$-haloalkyl and halogen;

R^6 is R^5, $(C_1\text{-}C_6)$-alkyl, $(C_1\text{-}C_6)$-haloalkyl;

m is 0 or 1, and

n is 0, 1 or 2,

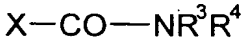
by reacting a 4-haloalkylpyri(mi)dinylcarboxamide of the formula (II),



(II)

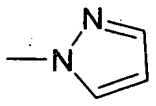
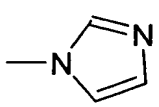
in which A, R^1, R^2 and m have the meaning indicated for formula (I),

in the presence of a base with a compound of the formula (III),



(III)

in which

X is  ,  or —O—R^7;

R^7 is (C_1-C_8)-alkyl, (C_3-C_6)-alkenyl, (C_3-C_6)-alkynyl, (C_3-C_8)-cycloalkyl, (C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl, aryl, heterocyclyl, aryl-(C_1-C_4)-alkyl or heterocyclyl-(C_1-C_4)-alkyl, where said groups are unsubstituted or substituted by one or more radicals from the group of halogen, CN and NO_2; and

R^3, R^4 have the meanings indicated for formula (I).

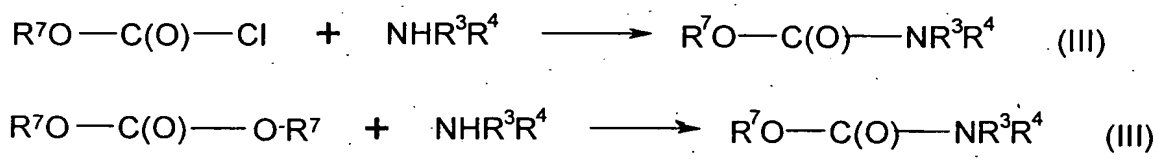
The process of the invention makes it possible to prepare acylurea derivatives in a simple manner under economically and ecologically advantageous conditions.

The starting compounds of the formula (II), 4-haloalkylpyri(mi)dylcarboxamides, are known and are described with their preparation for example in WO-02/48111, German patent application 102 23 274.1 and EP-A-0 580 374.

Compounds of the formula (III) can be prepared by known methods familiar to the skilled worker, by successive reaction of phosgene or other carbonic acid derivatives with a compound HX and with a suitable nitrogen compound, for example a secondary amine or hydroxylamine.

Processes of these types are described for example in Houben-Weyl, Methoden der Organischen Chemie, volume E4.

Carbamates of the formula (III) can be prepared for example from chloroformic esters or carbonates by reaction with suitable nitrogen compounds, for example amines or hydroxylamines.



This process is described for example in Coll. Czech. Chem. Comm. 48, 3, 1983, 900-905 and EP-A 0 577 167.

Preferred compounds of the formula (III) are those in which

X is OR^7 and

R^7 is unsubstituted or mono- or polyhalo, preferably F and/or Cl, -substituted (C_1-C_6)-alkyl or (C_3-C_6)-alkenyl, phenyl or benzyl, particularly preferably CH_3, C_2H_5, i-C_3H_7, -CH_2-CH=CH_2, -CH_2-CF_3, CH_2-CF_2-CF_2H, CCl_3, phenyl or benzyl, in particular -CH_2-CH=CH_2; AlkOAlk-; CH_3 or C_2H_5.

The molar ratio of amide (II) to compound (III) is generally 1:1 - 1.1, preferably 1:1 - 1.05, particularly preferably about 1:1.

Preference is given as base to hydrides, amides, hydroxides and (C_1-C_6)-alcoholates of the alkali metals and alkaline earth metals, alkyllithium compounds, metal hydrides, carbonates and acetates of the alkali metals and alkaline earth metals, tertiary amines having C_1-C_4-alkyl radicals and sterically hindered nitrogen bases. Particular preference is given to Na(OCH_3), K(OCH_3), Na(OC_2H_5), K(OC_2H_5), Na(O-t-C_4H_9), K(O-t-C_4H_9), Na(O-n-C_5H_{11}), K(O-n-C_5H_{11}), Na(O-i-C_5H_{11}), K(O-i-C_5H_{11}), NaH, LiN(i-C_3H_7)$_2$ (LDA), NaOH, KOH, Na_2CO_3, K_2CO_3, Na acetate, K acetate, triethylamine, 1,5-diazabicyclo[4.3.0]non-5-ene (DBU). Very particular preference is given to Na(OCH_3), KO(CH_3), Na(O-t-C_4H_9) and NaH, NaOH.

In a preferred variant, the salt formation is carried out under reduced pressure, preferably at a pressure in the range 20-200 mbar, particularly preferably 30-150 mbar, in particular 50-150 mbar. At the same time there is preferably distillation of the low-boiling products out of the reaction mixture, thus making complete amide salt formation possible. The reduced pressure is advantageously chosen so that the boiling point of the eliminated compounds, such as H_2O, CH_3OH, tButOH or EtOH, is below the reaction temperature, and the boiling point of the solvent is above the reaction temperature.

It is also possible to employ mixtures of a plurality of bases. In general, from 1 to 1.1, preferably 1-1.05, equivalents of base are employed, based on 1 equivalent of the amide.

The process is generally carried out in a solvent. Preference is given to polar, aprotic solvents, particularly preferably N,N-dimethylformamide (DMF), N-methylpyrrolidone (NMP), N,N-dimethylacetamide, dimethoxyethane, sulfolane and tetrahydrofuran (THF), very particularly preferably DMF and NMP.

Mixtures of solvents can also be employed.

In general, 1 - 20 equivalents by weight of solvent are used per equivalent of amide.

The reaction temperature is generally between 0 and 100°C, preferably between 30 and 75°C.

In a preferred variant, the reaction is carried out under reduced pressure, preferably at a pressure in the range 20-200 mbar, particularly preferably 30-150 mbar, in particular 50-150 mbar. At the same time there is preferably distillation of the low-boiling products out of the reaction mixture, thus making complete reaction possible. The reduced pressure is advantageously chosen so that the boiling point of the eliminated compound R_7OH, such as CH_3OH, tButOH, EtOH or CH_2=CH-CH_2OH,

is below the reaction temperature, and the boiling point of the solvent is above the reaction temperature.

The reaction generally takes from 1 to 4 hours.

Working up takes place by known methods familiar to the skilled worker, for example by filtration or extraction, washing and drying, and where appropriate subsequent chromatographic purification.

For amides of the formula (II) with R^2 = H, the process initially leads to the corresponding salts (R^2 = M) which can advantageously be removed from the reaction mixture in particularly high purity by filtration. Further working up can take place by known methods familiar to the skilled worker. For example, the precipitated product is filtered off, washed and dried. Compounds of the formula (I) with R^2 = H can be liberated from the salts of the formula (I) in a known manner familiar to the skilled worker, for example by reaction with acids such as HCl, H_2SO_4, CH_3CO_2H and H_3PO_4.

The terms used in the formulae (I) to (III) are explained in more detail below.

The term "halogen" means fluorine, chlorine, bromine and iodine, preferably fluorine and chlorine, particularly preferably fluorine.

"(C_1-C_4)-alkyl" is an unbranched or branched hydrocarbon radical having 1, 2, 3 or 4 carbon atoms, e.g. the methyl, ethyl, propyl, isopropyl, 1-butyl, 2-butyl, isobutyl or tert-butyl radical.

Correspondingly an alkyl radical with a larger range of carbon atoms means an unbranched or branched saturated hydrocarbon radical which contains a number of carbon atoms corresponding to this stated range. The term "(C_1-C_8)-alkyl"

accordingly includes the aforementioned alkyl radicals and, for example, the pentyl, 2-methylbutyl, 1,1-dimethylpropyl, hexyl, heptyl, octyl and tert-octyl radical.

"(C_1-C_4)-haloalkyl" is an alkyl group mentioned for "(C_1-C_4)-alkyl" in which one or more hydrogen atoms are replaced with the same number of identical or different halogen atoms, preferably chlorine or fluorine, e.g. the mono, di- or trifluoromethyl group, the 1- or 2-fluoroethyl, the 2,2,2-trifluoroethyl, the chloromethyl, trichloromethyl or the 1,1,2,2-tetrafluoroethyl group.

"Alkenyl" and "alkynyl" with a prefixed stated range of carbon atoms mean a straight-chain or branched hydrocarbon radical with a number of carbon atoms corresponding to the stated range and comprising at least one multiple bond, it being possible for the latter to be at any position in the relevant unsaturated radical.

"(C_3-C_6)-alkenyl" accordingly is, for example, the allyl, 2-methylpropenyl, 1- or 2-butenyl, pentenyl, 2-methylpentenyl or hexenyl group.

"(C_3-C_6)-alkynyl" is, for example, the propargyl, 2-methylpropynyl, 2-butynyl, pentynyl, 2-methylpentynyl or the hexynyl group.

"(C_3-C_{10})-cycloalkyl" means monocyclic alkyl radicals such as the cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl radical, bicyclic alkyl radicals such as the norbornyl or bicyclo[2.2.2]octyl radical, or fused systems such as the decahydronaphthyl radical.

The term "(C_3-C_6)-cycloalkyl-(C_1-C_4)-alkyl " means for example the cyclopropylmethyl, cyclopentylmethyl, cyclohexylmethyl, cyclohexylethyl and cyclohexylbutyl radical.

"(C_1-C_4)-alkoxy" and "(C_1-C_8)-alkoxy" are ether groups whose hydrocarbon radicals have the meanings indicated by the terms "(C_1-C_4)-alkyl" and "(C_1-C_8)-alkyl".

"(C_3-C_6)-alkenyloxy", "(C_3-C_6)-alkynyloxy", "(C_3-C_6)-cycloalkoxy" and "(C_4-C_{10})-cycloalkenyloxy" are ether groups whose hydrocarbon radicals have the meanings indicated for the terms "(C_3-C_6)-alkenyl", "(C_3-C_6)-alkynyl", "(C_3-C_8)-cycloalkyl" and "(C_4-C_{10})-cycloalkenyl".

The term "heterocyclyl" preferably means a cyclic radical which may be completely saturated, partly unsaturated or completely unsaturated or aromatic and which may be interrupted by at least one or more identical or different atoms from the group of nitrogen, sulfur or oxygen, although two oxygen atoms may not be directly adjacent, and at least one carbon atom must still be present in the ring, such as, for example, a radical of thiophene, furan, pyrrole, thiazole, oxazole, imidazole, isothiazole, isoxazole, pyrazole, 1,3,4-oxadiazole, 1,3,4-thiadiazole, 1,3,4-triazole, 1,2,4-oxadiazole, 1,2,4-thiadiazole, 1,2,4-triazole, 1,2,3-triazole, 1,2,3,4-tetrazole, benzo[b]thiophene, benzo[b]furan, indole, benzo[c]thiophene, benzo[c]furan, isoindole, benzoxazole, benzothiazole, benzimidazole, benzisoxazole, benzisothiazole, benzopyrazole, benzothiadiazole, benzotriazole, dibenzofuran, dibenzothiophene, carbazole, pyridine, pyrazine, pyrimidine, pyridazine, 1,3,5-triazine, 1,2,4-triazine, 1,2,4,5-tetrazine, quinoline, isoquinoline, quinoxaline, quinazoline, cinnoline, 1,8-naphthyridine, 1,5-naphthyridine, 1,6-naphthyridine, 1,7-naphthyridine, phthalazine, pyridopyrimidine, purine, pteridine, 4H-quinolizine, piperidine, pyrrolidine, oxazoline, tetrahydrofuran, tetrahydropyran, isoxazolidine or thiazolidine.

Heterocyclyl particularly preferably means a saturated, partially saturated or aromatic ring system having 3 to 6 ring members and 1 to 4 heteroatoms from the group of O, S and N, it being necessary for at least one carbon atom to be present in the ring.

Heterocyclyl very particularly preferably means a radical of pyridine, pyrimidine, (1,2,4)-oxadiazole, (1,3,4)-oxadiazole, pyrrole, furan, thiophene, oxazole, thiazole, imidazole, pyrazole, isoxazole, 1,2,4-triazole, tetrazole, pyrazine, pyridazine, oxazoline, thiazoline, tetrahydrofuran, tetrahydropyran, morpholine, piperidine, piperazine, pyrroline, pyrrolidine, oxazolidine, thiazolidine, oxirane and oxetane.

"Aryl" preferably means an aryl radical having 6 to 12, particularly preferably 6 to 10, carbon atoms, for example the phenyl or naphthyl group, very particularly preferably a phenyl group.

The symbols and indices in formulae (I) to (III) preferably have the following meanings:

A is preferably CH.

R^1 is preferably a (C_1-C_4)-alkyl group which is substituted one or more times by F and/or Cl, particularly preferably CF_3, CHF_2 or CF_2Cl, especially CF_3.

R^2 is preferably M or H.

M is preferably a non-oxidizable inorganic or organic cation, particularly preferably Li, Na, K, Cs, $Ca^{2+}/_2$, $N[(C_1-C_4)\text{-alkyl}]_4$, such as $N(CH_3)_4$, $N(C_2H_5)_4$, very particularly preferably Na.

R^3 is preferably (C_1-C_8)-alkyl, (C_3-C_6)-alkenyl, (C_3-C_6)-alkynyl, (C_1-C_8)-alkoxy, (C_3-C_6)-alkenyloxy, (C_3-C_6)-alkynyloxy, (C_3-C_8)-cycloalkyl, (C_3-C_8)-cycloalkyl-(C_1-C_6)-alkyl, O-CH_2-(C_3-C_8)-cycloalkyl, where the last nine groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, aryloxy, heterocyclyloxy, -CH_2-aryl, -O-CH_2-aryl, -CH_2-heterocyclyl, -O-CH_2-heterocyclyl, where the last eight groups mentioned are unsubstituted or substituted by one or more R^6 radicals.

R^4 is preferably (C_1-C_8)-alkyl, (C_3-C_6)-alkenyl, (C_3-C_6)-alkynyl, (C_3-C_8)-cycloalkyl, (C_3-C_8)-cycloalkyl-(C_1-C_6)-alkyl, where the last five groups mentioned are unsubstituted or substituted by one or more R^5 radicals, or is aryl, heterocyclyl, -CH_2-aryl, -CH_2-heterocyclyl, where the last four groups mentioned are unsubstituted or substituted by one or more R^6 radicals.

R^5 is preferably halogen, in particular F, Cl, (C_1-C_6)-alkoxy, (C_1-C_6)-haloalkoxy.

R^6 is preferably R^5, (C_1-C_6)-alkyl, (C_1-C_6)-haloalkyl.

R^7 is preferably unsubstituted or mono- or polyhalo, preferably F and/or Cl, -substituted (C_1-C_6)-alkyl or (C_3-C_6)-alkenyl, phenyl or benzyl, particularly preferably CH_3, C_2H_5, i-C_3H_7, $-CH_2-CH=CH_2$, $-CH_2-CF_3$, $CH_2-CF_2-CF_2H$, CCl_3, phenyl or benzyl, in particular CH_3 or C_2H_5.

X is preferably $-O-R^7$.

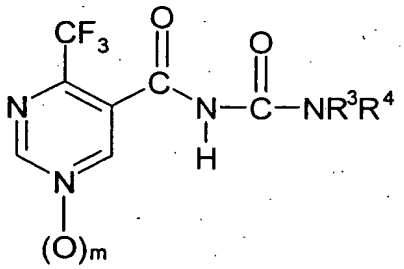
m is preferably 0.

n is preferably 0, 1 or 2.

Preferred compounds of the formula (I) to (III) are those in which all the symbols and indices have the preferred meanings.

The compounds of the formula (I) are in some cases known and in some cases novel.

The invention therefore also relates to the compounds of the formula (I)', i.e. of the formulae (Ia), (Ib) and (Ic),

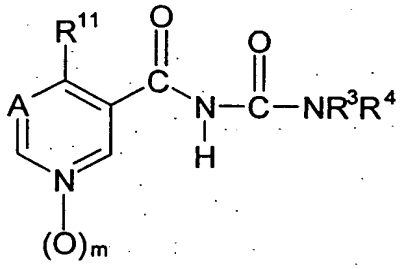


(Ia)

where

R^3, R^4 and m have the meaning indicated for formula (I).

The invention likewise relates to compounds of the formula (Ib),



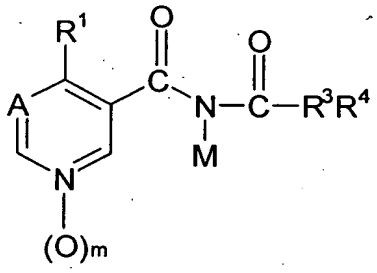
(Ib)

where

R^{11} is $(C_1$-$C_4)$-haloalkyl with the exception of CF_3, preferably CHF_2 or CF_2Cl; and

A, R^3, R^4, m have the meanings indicated for formula (I).

The invention further relates to compounds of the formula (Ic),



(Ic)

in which

M is an organic or inorganic cation, preferably Li, Na, K, Cs, 1/2 Ca, $N[(C_1$-$C_4)$-alkyl$]_4$, such as $N(CH_3)_4$ or $N(C_2H_5)_4$, very particularly preferably Na, K and Li; and

A, R^1, R^3, R^4 and m have the meanings indicated for formula (I).

Preferred compounds of the formulae (Ia) - (Ic) are those in which the symbols and indices have the meanings indicated as preferred for formula (I).

"Insecticide" means hereinafter, unless otherwise evident from the context, an activity against harmful arthropods such as insects and arachnids, and helminths such as nematodes.

The compounds of the formula (I)' are suitable for controlling animal pests, in particular insects, arachnids and helminths, preferably for controlling insects and arachnids which are encountered in agriculture, in livestock breeding, in forests, in the protection of stored goods and materials, and in the hygiene sector, and have good plant tolerance and favorable toxicity to warm-blooded species. They are active against normally sensitive and resistant species and against all or individual developmental stages. The abovementioned pests include:

From the order of the Acarina, for example, Acarus siro, Argas spp., Ornithodoros spp., Dermanyssus gallinae, Eriophyes ribis, Phyllocoptruta oleivora, Boophilus spp., Rhipicephalus spp., Amblyomma spp., Hyalomma spp., Ixodes spp., Psoroptes spp., Chorioptes spp., Sarcoptes spp., Tarsonemus spp., Bryobia praetiosa, Panonychus spp., Tetranychus spp., Eotetranychus spp., Oligonychus spp., Eutetranychus spp..

From the order of the Isopoda, for example, Oniscus aselus, Armadium vulgare, Porcellio scaber.

From the order of the Diplopoda, for example, Blaniulus guttulatus.

From the order of the Chilopoda, for example, Geophilus carpophagus, Scutigera spp..

From the order of the Symphyla, for example, Scutigerella immaculata.

From the order of the Thysanura, for example, Lepisma saccharina.

From the order of the Collembola, for example, Onychiurus armatus.

From the order of the Orthoptera, for example, Blatta orientalis, Periplaneta americana, Leucophaea maderae, Blattella germanica, Acheta domesticus, Gryllotalpa spp., Locusta migratoria migratorioides, Melanoplus differentialis, Schistocerca gregaria.

From the order of the Isoptera, for example, Reticulitermes spp..

From the order of the Anoplura, for example, Phylloera vastatrix, Pemphigus spp., Pediculus humanus corporis, Haematopinus spp., Linognathus spp..

From the order of the Mallophaga, for example, Trichodectes pp., Damalinea spp..
From the order of the Thysanoptera, for example, Hercinothrips femoralis, Thrips tabaci.
From the order of the Heteroptera, for example, Eurygaster spp., Dysdercus intermedius, Piesma quadrata, Cimex lectularius, Rhodnius prolixus, Triatoma spp..
From the order of the Homoptera, for example, Aleurodes brassicae, Bemisia tabaci, Trialeurodes vaporariorum, Aphis gossypii, Brevicoryne brassicae, Cryptomyzus ribis, Doralis fabae, Doralis pomi, Eriosoma lanigerum, Hyalopterus arundinis, Macrosiphum avenae, Myzus spp., Phorodon humuli, Rhopalosiphum padi, Empoasca spp., Euscelus bilobatus, Nephotettix cincticeps, Lecanium corni, Saissetia oleae, Laodelphax striatellus, Nilaparvata lugens, Aonidiella aurantii, Aspidiotus hederae, Pseudococcus spp., Psylla spp..
From the order of the Lepidoptera, for example, Pectinophora gossypiella, Bupalus piniarius, Cheimatobia brumata, Lithocolletis blancardella, Hyponomeuta padella, Plutella maculipennis, Malacosoma neustria, Euproctis chrysorrhoea, Lymantria spp., Bucculatrix thurberiella, Phyllocnistis citrella, Agrotis spp., Euxoa spp., Feltia spp., Earias insulana, Heliothis spp., Laphygma exigua, Mamestra brassicae, Panolis flammea, Prodenia litura, Spodoptera spp., Trichoplusia ni, Carpocapsa pomonella, Pieris spp., Chilo spp., Pyrausta nubilalis, Ephestia kuehniella, Galleria mellonella, Cacoecia podana, Capua reticulana, Choristoneura fumiferana, Clysia ambiguella, Homona magnanima, Tortrix viridana.
From the order of the Coleoptera, for example, Anobium punctatum, Rhizopertha dominica, Bruchidius obtectus, Acanthoscelides obtectus, Hylotrupes bajulus, Agelastica alni, Leptinotarsa decemlineata, Phaedon cochleariae, Diabrotica spp., Psylloides chrysocephala, Epilachna varivestis, Atomaria spp., Oryzaephilus surinamensis, Anthonomus spp., Sitophilus spp., Otiorrhynchus sulcatus, Cosmopolites sordidus, Ceuthorrynchus assimilis, Hypera postica, Dermestes spp., Trogoderma, Anthrenus spp., Attagenus spp., Lyctus spp., Meligethes aeneus, Ptinus spp., Niptus hololeucus, Gibbium psylloides, Tribolium spp., Tenebrio molitor, Agriotes spp., Conoderus spp., Melolontha melolontha, Amphimallon solstitialis, Costelytra zealandica.

From the order of the Hymenoptera, for example, Diprion spp., Hoplocampa spp., Lasius spp., Monomorium pharaonis, Vespa spp..
From the order of the Diptera, for example, Aedes spp., Anopheles spp., Culex spp., Drosophila melanogaster, Musca spp., Fannia spp., Calliphora erythrocephala, Lucilia spp., Chrysomyia spp., Cuterebra spp., Gastrophilus spp., Hypobosca spp., Stomoxys spp., Oestrus spp., Hypoderma spp., Tabanus spp., Tannia spp., Bibio hortulanus, Oscinella frit, Phorbia spp., Pegomyia hyoscyami, Ceratitis capitata, Dacus oleae, Tipula paludosa.
From the order of the Siphonaptera, for example, Xenopsylla cheopsis, Ceratophyllus spp..
From the order of the Arachnida, for example, Scorpio maurus, Latrodectus mactans.
From the class of the helminths, for example, Haemonchus, Trichostrongylus, Ostertagia, Cooperia, Chabertia, Strongyloides, Oesophagostomum, Hyostrongylus, Ancylostoma, Ascaris and Heterakis and also Fasciola.
From the class of the Gastropoda, for example, Deroceras spp., Arion spp., Lymnaea spp., Galba spp., Succinea spp., Biomphalaria spp., Bulinus spp., Oncomelania spp..
From the class of the Bivalva, for example, Dreissena spp..
It is furthermore possible to control Protozoa, such as Eimeria.

The plant-parasitic nematodes which can be controlled in accordance with the invention include, for example, the root-parasitic soil-dwelling nematodes such as, for example, those of the genera Meloidogyne (root knot nematodes, such as Meloidogyne incognita, Meloidogyne hapla and Meloidogyne javanica), Heterodera and Globodera (cyst-forming nematodes, such as Globodera rostochiensis, Globodera pallida, Heterodera trifolii) and of the genera Radopholus, such as Radopholus similis, Pratylenchus such as Pratylenchus neglectus, Pratylenchus penetrans and Pratylenchus curvitatus; Tylenchulus such as Tylenchulus semipenetrans, Tylenchorhynchus, such as Tylenchorhynchus dubius and Tylenchorhynchus claytoni, Rotylenchus such as Rotylenchus robustus, Heliocotylenchus such as Haliocotylenchus multicinctus, Belonoaimus such as

Belonoaimus longicaudatus, Longidorus such as Longidorus elongatus, Trichodorus such as Trichodorus primitivus and Xiphinema such as Xiphinema index.

Nematode genera which can furthermore be controlled using the compounds according to the invention are Ditylenchus (stem parasites, such as Ditylenchus dipsaci and Ditylenchus destructor), Aphelenchoides (foliar nematodes, such as Aphelenchoides ritzemabosi) and Anguina (flower and leaf-gall nematodes, such as Anguina tritici).

The compounds according to the invention are preferably suitable for controlling sucking insects, such as aphids (for example Aphis fabae, Aphis pomi, Aphis spiraecola, Aphis gossypii, Aphis nasturtii, Dysaphis plantaginea, Eriosoma spp., Rhopalosiphum padi, Acyrthosiphon pisum, Pemphigus bursarius, Myzus persicae, Myzus nicotianae, Myzus euphorbiae, Phylloxera spp., Toxoptera spp, Brevicoryne brassicae, Macrosiphum avenae, Macrosiphum euphorbiae, Nasonovia ribisnigri, Sitobion avenae, Brachycaudus helychrysii or Phorodon humuli), cicadas (Idioscopus clypealis, Scaphoides titanus, Empoasca onuki, Empoasca vitis, Empoasca devastans, Empoasca libyca, Empoasca biguttula, Empoasca facialis, or Erythroneura spp), Thrips (Hercinothrips femoralis, Scirtothrips aurantii, Scirtothrips dorsalis, Frankliniella schultzei, Frankliniella fusca, Frankliniella occidentalis, Frankliniella tritici, Kakothrips spp., Thrips oryzae, Thrips palmi, Thrips tabaci) or white flies (Aleurodes brassicae, Bemisia tabaci, Trialeurodes vaporariorum, Aleurodes proletella) and mealybugs (Dysmicoccus spp., Planococcus spp., Phenacoccus spp.).

The invention also relates to compositions, for example pesticides, preferably insecticidal, acaricidal, and nematicidal, especially preferably insecticidal and acaricidal, compositions which comprise one or more compounds of the formula (I) in addition to suitable formulation auxiliaries.

To prepare the compositions according to the invention, the active compound and the other additives are combined and brought into a suitable use form.

In general, the compositions according to the invention comprise 1 to 95% by weight of the active compounds of the formula (I). They can be formulated in various ways, depending on the biological and/or chemical-physical parameters which prevail. The following are examples of possible formulations:

Wettable powders (WP), emulsifiable concentrates (EC), aqueous solutions (SL), emulsions, sprayable solutions, oil- or water-based dispersions (SC), suspo-emulsions (SE), dusts (DP), seed-dressing products, granules in the form of microgranules, spray granules, coated granules and adsorption granules, water-dispersible granules (WG), ULV formulations, microcapsules, waxes or baits.

These individual types of formulations are known in principle and are described, for example, in: Winnacker-Küchler, "Chemische Technologie" [Chemical Technology], Volume 7, C. Hanser Verlag Munich, 4th Edition 1986; van Falkenberg, "Pesticides Formulations", Marcel Dekker N.Y., 2nd Ed. 1972-73; K. Martens, "Spray Drying Handbook", 3rd Ed. 1979, G. Goodwin Ltd. London.

The necessary formulation auxiliaries, i.e. carrier materials and/or surface-active compounds such as inert materials, surfactants, solvents and other additives, are also known and described, for example, in: Watkins, "Handbook of Insecticide Dust Diluents and Carriers", 2nd Ed., Darland Books, Caldwell N.J.; H. v. Olphen, "Introduction to Clay Colloid Chemistry", 2nd Ed., J. Wiley & Sons, N.Y.; Marsden, "Solvents Guide", 2nd Ed., Interscience, N.Y. 1950; McCutcheon's, "Detergents and Emulsifiers Annual", MC Publ. Corp., Ridgewood N.J.; Sisley and Wood, "Encyclopedia of Surface Active Agents", Chem. Publ. Co. Inc., N.Y. 1964; Schönfeldt, "Grenzflächenaktive Äthylenoxidaddukte" [Surface-active ethylene oxide adducts], Wiss. Verlagsgesell., Stuttgart 1967; Winnacker-Küchler, "Chemische Technologie", Volume 7, C. Hanser Verlag Munich, 4th Edition 1986.

Based on these formulations, it is also possible to prepare combinations with other pesticidally active materials, fertilizers and/or growth regulators, for example in the form of a ready-mix formulation or a tank mix. Wettable powders are preparations which are uniformly dispersible in water which, besides the active compound, also

comprise wetters, for example polyoxyethylated alkylphenols, polyoxyethylated fatty alcohols, alkylsulfonates or alkylphenolsulfonates and dispersants, for example sodium lignosulfonate or sodium 2,2'- dinaphthylmethane-6,6'-disulfonate, in addition to a diluent or inert material.

Emulsifiable concentrates are prepared by dissolving the active compound in an organic solvent, for example butanol, cyclohexanone, dimethylformamide, xylene or else higher-boiling aromatics or hydrocarbons, with addition of one or more emulsifiers. As emulsifiers, the following can be used, for example: calcium alkylaryl-sulfonates such as calcium dodecylbenzenesulfonate, or nonionic emulsifiers such as fatty acid polyglycol esters, alkylaryl polyglycol ethers, fatty alcohol polyglycol ethers, propylene oxide/ethylene oxide condensates, alkyl polyethers, sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters or polyoxyethylene sorbitol esters.

Dusts are obtained by grinding the active compound with finely divided solid materials, for example talc or natural clays, such as kaolin, bentonite, pyrophyllite or diatomaceous earth. Granules can be prepared either by atomizing the active compound onto adsorptive, granulated inert material or by applying active compound concentrates onto the surface of carrier materials such as sand or kaolinites, or of granulated inert material, by means of adhesives, for example polyvinyl alcohol or sodium polyacrylate, or else mineral oils. Suitable active compounds can also be granulated in the manner which is customary for the preparation of fertilizer granules, if desired as a mixture with fertilizers.

The active compound concentration in wettable powders is usually approximately 10 to 90% by weight, the remainder to 100% by weight is composed of customary formulation constituents. In the case of emulsifiable concentrates, the active compound concentration may be approximately 5 to 80% by weight. Formulations in the form of dusts usually comprise 5 to 20% by weight of active compound, sprayable solutions approximately 2 to 20% by weight. In the case of granules, the

active compound content depends partly on whether the active compound is in liquid or solid form and on which granulation auxiliaries, fillers and the like are being used.

Besides this, the abovementioned active compound formulations comprise, if appropriate, the tackifiers, wetters, dispersants, emulsifiers, penetrants, solvents, fillers or carriers which are conventional in each case.

For use, the concentrates, which are present in commercially available form, are, if desired, diluted in the customary manner, for example in the case of wettable powders, emulsifiable concentrates, dispersions and in some cases also micro-granules, using water. Preparations in the form of dusts and granules and sprayable solutions are usually not diluted any further with other inert substances prior to use.

The application rate required varies with the external conditions such as, inter alia, temperature and humidity. It may vary within wide limits, for example between 0.0005 and 10.0 kg/ha or more of active compound, but it is preferably between 0.001 and 5 kg/ha of active compound.

The active compounds according to the invention, in their commercially available formulations and in the use forms prepared from these formulations, may be present in mixtures with other active compounds such as insecticides, attractants, sterilants, acaricides, nematicides, fungicides, growth regulatory substances herbicides or safeners.

Preferred components in mixtures are, for example:

Fungicides:

2-phenylphenol; 8-hydroxyquinoline sulfate; acibenzolar-S-methyl; aldimorph; amido-flumet; ampropylfos; ampropylfos-potassium; andoprim; anilazine; azaconazole; azoxystrobin; benalaxyl; benodanil; benomyl; benthiavalicarb-isopropyl; benzamacril; benzamacril-isobutyl; bilanafos; binapacryl; biphenyl; bitertanol; blasticidin-S;

bromuconazole; bupirimate; buthiobate; butylamine; calcium polysulfide; capsimycin; captafol; captan; carbendazim; carboxin; carpropamid; carvone; chinomethionat; chlobenthiazone; chlorfenazole; chloroneb; chlorothalonil; chlozolinate; clozylacon; cyazofamid; cyflufenamid; cymoxanil; cyproconazole; cyprodinil; cyprofuram; dagger G; debacarb; dichlofluanid; dichlone; dichlorophen; diclocymet; diclomezine; dicloran; diethofencarb; difenoconazole; diflumetorim; dimethirimol; dimethomorph; dimoxystrobin; diniconazole; diniconazole-M; dinocap; diphenylamine; dipyrithione; ditalimfos; dithianon; dodine; drazoxolon; edifenphos; epoxiconazole; ethaboxam; ethirimol; etridiazole; famoxadone; fenamidone; fenapanil; fenarimol; fenbuconazole; fenfuram; fenhexamid; fenitropan; fenoxanil; fenpiclonil; fenpropidin; fenpropimorph; ferbam; fluazinam; flubenzimine; fludioxonil; flumetover; flumorph; fluoromide; fluoxastrobin; fluquinconazole; flurprimidol; flusilazole; flusulfamide; flutolanil; flutriafol; folpet; fosetyl-al; fosetyl-sodium; fuberidazole; furalaxyl; furametpyr; furcarbanil; furmecyclox; guazatine; hexachlorobenzene; hexaconazole; hymexazol; imazalil; imibenconazole; iminoctadine triacetate; iminoctadine tris(albesil; iodocarb; ipconazole; iprobenfos; iprodione; iprovalicarb; irumamycin; isoprothiolane; isovaledione; kasugamycin; kresoxim-methyl; mancozeb; maneb; meferimzone; mepanipyrim; mepronil; metalaxyl; metalaxyl-M; metconazole; methasulfocarb; methfuroxam; metiram; metominostrobin; metsulfovax; mildiomycin; myclobutanil; myclozolin; natamycin; nicobifen; nitrothal-isopropyl; noviflumuron; nuarimol; ofurace; orysastrobin; oxadixyl; oxolinic acid; oxpoconazole; oxycarboxin; oxyfenthiin; paclobutrazol; pefurazoate; penconazole; pencycuron; phosdiphen; phthalide; picoxystrobin; piperalin; polyoxins; polyoxorim; probenazole; prochloraz; procymidone; propamocarb; propanosine-sodium; propiconazole; propineb; proquinazid; prothioconazole; pyraclostrobin; pyrazophos; pyrifenox; pyrimethanil; pyroquilon; pyroxyfur; pyrrolnitrine; quinconazole; quinoxyfen; quintozene; simeconazole; spiroxamine; sulfur; tebuconazole; tecloftalam; tecnazene; tetcyclacis; tetraconazole; thiabendazole; thicyofen; thifluzamide; thiophanate-methyl; thiram; tioxymid; tolclofos-methyl; tolylfluanid; triadimefon; triadimenol; triazbutil; triazoxide; tricyclamide; tricyclazole; tridemorph; trifloxystrobin; triflumizole; triforine; triticonazole; uniconazole; validamycin A; vinclozolin; zineb; ziram; zoxamide; (2S)-N-[2-[4-[[3-(4-chlorophenyl)-2-propynyl]oxy]-3-methoxyphenyl]ethyl]-

3-methyl-2-[(methylsulfonyl)amino]-butanamide; 1-(1-naphthalenyl)-1H-pyrrole-2,5-dione; 2,3,5,6-tetrachloro-4-(methylsulfonyl)-pyridine; 2-amino-4-methyl-N-phenyl-5-thiazolecarboxamide; 2-chloro-N-(2,3-dihydro-1,1,3-trimethyl-1H-inden-4-yl)-3-pyridincarboxamide; 3,4,5-trichloro-2,6-pyridinedicarbonitrile; actinovate; cis-1-(4-chlorophenyl)-2-(1H-1,2,4-triazole-1-yl)-cycloheptanol; methyl 1-(2,3-dihydro-2,2-dimethyl-1H-inden-1-yl)-1H-imidazole-5-carboxylate; monopotassium carbonate; N-(6-methoxy-3-pyridinyl)-cyclopropanecarboxamide; N-butyl-8-(1,1-dimethylethyl)-1-oxaspiro[4.5]decan-3-amine; sodium tetrathiocarbonate;

and copper salts and preparations such as Bordeaux mixture; copper hydroxide; copper naphthenate; copper oxychloride; copper sulfate; cufraneb; cuprous oxide; mancopper; oxine-copper.

Bactericides:

bronopol, dichlorophen, nitrapyrin, nickel dimethyldithiocarbamate, kasugamycin, octhilinone, furancarboxylic acid, oxytetracycline, probenazole, streptomycin, tecloftalam, copper sulfate and other copper preparations.

Insecticides/acaricides/nematicides:

abamectin, ABG-9008, acephate, acequinocyl, acetamiprid, acetoprole, acrinathrin, AKD-1022, AKD-3059, AKD-3088, alanycarb, aldicarb, aldoxycarb, allethrin, alpha-cypermethrin (alphamethrin), amidoflumet, aminocarb, amitraz, avermectin, AZ-60541, azadirachtin, azamethiphos, azinphos-methyl, azinphos-ethyl, azocyclotin,

Bacillus popilliae, Bacillus sphaericus, Bacillus subtilis, Bacillus thuringiensis, Bacillus thuringiensis strain EG-2348, Bacillus thuringiensis strain GC-91, Bacillus thuringiensis strain NCTC-11821, baculoviruses, Beauveria bassiana, Beauveria tenella, benclothiaz, bendiocarb, benfuracarb, bensultap, benzoximate, beta-cyfluthrin, beta-cypermethrin, bifenazate, bifenthrin, binapacryl, bioallethrin, bioallethrin-S-cyclopentyl-isomer, bioethanomethrin, biopermethrin, bioresmethrin, bistrifluron,

BPMC, brofenprox, bromophos-ethyl, bromopropylate, bromfenvinfos (-methyl), BTG-504, BTG-505, bufencarb, buprofezin, butathiofos, butocarboxim, butoxycarboxim, butylpyridaben,

cadusafos, camphechlor, carbaryl, carbofuran, carbophenothion, carbosulfan, cartap, CGA-50439, chinomethionat, chlordane, chlordimeform, chloethocarb, chlorethoxyfos, chlorfenapyr, chlorfenvinphos, chlorfluazuron, chlormephos, chlorobenzilate, chloropicrin, chlorproxyfen, chlorpyrifos-methyl, chlorpyrifos (-ethyl), chlovaporthrin, chromafenozide, cis-cypermethrin, cis-resmethrin, cis-permethrin, clocythrin, cloethocarb, clofentezine, clothianidin, clothiazoben, codlemone, coumaphos, cyanofenphos, cyanophos, cycloprene, cycloprothrin, cyfluthrin, cyhalothrin, cyhexatin, cypermethrin, cyphenothrin (1R-trans isomer), cyromazine,

DDT, deltamethrin, demeton-S-methyl, demeton-S-methylsulphon, diafenthiuron, dialifos, diazinon, dichlofenthion, dichlorvos, dicofol, dicrotophos, dicyclanil, diflubenzuron, dimefluthrin, dimethoate, dimethylvinphos, dinobuton, dinocap, dinotefuran, diofenolan, disulfoton, docusat-sodium, dofenapyn, DOWCO-439,

eflusilanate, emamectin, emamectin benzoate, empenthrin (1R isomer), endosulfan, entomopthora spp., EPN, esfenvalerate, ethiofencarb, ethiprole, ethion, ethoprophos, etofenprox, etoxazole, etrimfos,

famphur, fenamiphos, fenazaquin, fenbutatin oxide, fenfluthrin, fenitrothion, fenobucarb, fenothiocarb, fenoxacrim, fenoxycarb, fenpropathrin, fenpyrad, fenpyrithrin, fenpyroximate, fensulfothion, fenthion, fentrifanil, fenvalerate, fipronil, flonicamid, fluacrypyrim, fluazuron, flubenzimine, flubrocythrinate, flucycloxuron, flucythrinate, flufenerim, flufenoxuron, flufenprox, flumethrin, flupyrazofos, flutenzin (flufenzine), fluvalinate, fonofos, formetanate, formothion, fosmethilan, fosthiazate, fubfenprox (fluproxyfen), furathiocarb,

gamma-cyhalothrin, gamma-HCH, gossyplure, grandlure, granulosis viruses, halfenprox, halofenozide, HCH, HCN-801, heptenophos, hexaflumuron, hexythiazox, hydramethylnone, hydroprene,

IKA-2002, imidacloprid, imiprothrin, indoxacarb, iodofenphos, iprobenfos, isazofos, isofenphos, isoprocarb, isoxathion, ivermectin,

japonilure,

kadethrin, kernpolyederviren, kinoprene,

lambda-cyhalothrin, lindane, lufenuron,

malathion, mecarbam, mesulfenfos, metaldehyd, metam-sodium, methacrifos, methamidophos, Metarhizium anisopliae, Metarhizium flavoviride, methidathion, methiocarb, methomyl, methoprene, methoxychlor, methoxyfenozide, metofluthrin, metolcarb, metoxadiazone, mevinphos, milbemectin, milbemycin, MKI-245, MON-45700, monocrotophos, moxidectin, MTI-800,

naled, NC-104, NC-170, NC-184, NC-194, NC-196, niclosamide, nicotine, nitenpyram, nithiazine, NNI-0001, NNI-0101, NNI-0250, NNI-9768, novaluron, noviflumuron,

OK-5101, OK-5201, OK-9601, OK-9602, OK-9701, OK-9802, omethoate, oxamyl, oxydemeton-methyl,

Paecilomyces fumosoroseus, parathion-methyl, parathion (-ethyl), permethrin (cis-, trans-), petroleum, PH-6045, phenothrin (1R-trans isomer), phenthoate, phorate, phosalone, phosmet, phosphamidon, phosphocarb, phoxim, piperonyl butoxide, pirimicarb, pirimiphos-methyl, pirimiphos-ethyl, potassium oleate, prallethrin, profenofos, profluthrin, promecarb, propaphos, propargite, propetamphos, propoxur, prothiofos, prothoate, protrifenbute, pymetrozine, pyraclofos, pyresmethrin,

pyrethrum, pyridaben, pyridalyl, pyridaphenthion, pyridathion, pyrimidifen, pyriproxyfen,

quinalphos,

resmethrin, RH-5849, ribavirin, RU-12457, RU-15525,

S-421, S-1833, salithion, sebufos, SI-0009, silafluofen, spinosad, spirodiclofen, spiromesifen, sulfluramid, sulfotep, sulprofos, SZI-121,

tau-fluvalinate, tebufenozide, tebufenpyrad, tebupirimfos, teflubenzuron, tefluthrin, temephos, temivinphos, terbam, terbufos, tetrachlorvinphos, tetradifon, tetramethrin, tetramethrin (1R isomer), tetrasul, theta-cypermethrin, thiacloprid, thiamethoxam, thiapronil, thiatriphos, thiocyclam hydrogen oxalate, thiodicarb, thiofanox, thiometon, thiosultap-sodium, thuringiensin, tolfenpyrad, tralocythrin, tralomethrin, transfluthrin, triarathene, triazamate, triazophos, triazuron, trichlophenidine, trichlorfon, Trichoderma atroviride, triflumuron, trimethacarb,

vamidothion, vaniliprole, verbutin, Verticillium lecanii,

WL-108477, WL-40027,

YI-5201, YI-5301, YI-5302,

XMC, xylylcarb,

ZA-3274, zeta-cypermethrin, zolaprofos, ZXI-8901,

the compound 3-methylphenyl propylcarbamate (Tsumacide Z),

the compound 3-(5-chloro-3-pyridinyl)-8-(2,2,2-trifluoroethyl)-8-azabicyclo[3.2.1]-octane-3-carbonitrile (CAS Reg. No. 185982-80-3) and the corresponding 3-endo

isomer (CAS Reg. No. 185984-60-5) (cf. WO-96/37494, WO-98/25923),

and preparations which comprise plant extracts, nematodes, fungi or viruses having insecticidal activity.

The abovementioned components for combinations are known active compounds, many of which are described in C.D.S. Tomlin (Ed.), The Pesticide Manual, 12th Edition, British Crop Protection Council, Farnham 2000.

The active compound content of the use forms prepared from the commercially available formulations may range from 0.00000001 up to 95% by weight of active compound, preferably between 0.00001 and 1% by weight.

Application is effected in a customary manner adapted to suit the use forms.

Accordingly, the invention also provides the use of compounds of the formula (I)' and salts thereof for controlling animal pests, preferably harmful arthropods, such as insects and arachnids and helminths such as nematodes.

The invention furthermore provides a method for controlling harmful insects, arachnids and/or helminths which comprises applying an effective amount of a compound of the formula (I)' or a salt thereof onto the pests or the site of the desired action.

The active compounds according to the invention are also suitable for controlling endoparasites and ectoparasites in the veterinary medicine sector and/or in the field of animal keeping. The active compounds according to the invention are applied here in a known manner, such as by oral administration in the form of, for example, tablets, capsules, drinks or granules, by dermal application in the form of, for example, dipping, spraying, pouring on and spotting on, and dusting, and by parenteral administration in the form of, for example, an injection.

Accordingly, the invention also provides the use of compounds of the formula (I)' or of a salt thereof for preparing a medicament for human and/or veterinary medicine, preferably a medicament for veterinary medicine, in particular for the control of ecto- and/or endoparasites.

Accordingly, the compounds of the formula (I)' according to the invention can also be employed advantageously in livestock keeping (for example cattle, sheep, pigs and poultry such as chickens, geese and the like). In a preferred embodiment of the invention, the compounds, if appropriate in suitable formulations, are administered orally to the animals, if appropriate together with the drinking water or feed. Since excretion in the feces is efficient, the development of insects in the animals' feces can be prevented very easily in this manner. The dosages and formulations which are suitable in each case depend, in particular, on the species and the developmental stage of the productive livestock and also on the risk of infestation and can be determined readily and established by customary methods. For example, the compounds can be employed in cattle at dosages of 0.01 to 1 mg/kg of bodyweight.

In addition to the abovementioned application methods, the active compounds of the formula (I)' according to the invention have excellent systemic action. Accordingly, the active compounds can also be introduced into the plants via parts of the plant, both below ground and above ground (root, stem, leaf), if the active compounds are applied, in liquid or solid form in the direct vicinity of the plant (for example granules in soil application, application in flooded rice paddies).

Furthermore, the active compounds according to the invention are particularly useful for the treatment of vegetative and generative plant propagation material, such as, for example, of seeds, for example of cereals, vegetables, cotton, rice, sugar beet and other crops and ornamental plants, of bulbs, seedlings and tubers of other crops and ornamental plants which are propagated vegetatively. The treatment can be carried out before sowing or before planting (for example by special seed coating techniques, by dressing in liquid or solid form or as a seed box treatment), during

sowing or planting or after sowing or planting by special application techniques (for example furrow treatment). The amount of active compound used can vary within a relatively large range, depending on the application. In general, the application rates are between 1 g and 10 kg of active compound per hectare of soil surface.

The compounds of the formula (I)' can also be employed for controlling animal pests in crops of known genetically engineered plants or genetically engineered plants yet to be developed. As a rule, the transgenic plants are distinguished by especially advantageous properties, for example by resistances to particular crop protection agents, resistances to plant diseases or pathogens of plant diseases, such as particular insects or microorganisms such as fungi, bacteria or viruses. Other particular properties concern, for example, the harvested material with regard to quantity, quality, storage properties, composition and specific constituents. Thus, transgenic plants are known where the starch content is increased, or the starch quality is altered, or where the harvested material has a different fatty acid composition.

The use in economically important transgenic crops of useful plants and ornamentals is preferred, for example of cereals such as wheat, barley, rye, oats, millet, rice, cassava and corn or else crops of sugar beet, cotton, soybean, oilseed rape, potatoes, tomatoes, peas and other types of vegetables.

When used in transgenic crops, in particular those which have resistances to insects, effects are frequently observed, in addition to the effects against harmful organisms to be observed in other crops, which are specific for application in the transgenic crop in question, for example an altered or specifically widened spectrum of pests which can be controlled, or altered application rates which may be employed for application.

The invention therefore also relates to the use of compounds of the formula (I)' for controlling harmful organisms in transgenic crop plants.

The use of the compounds according to the invention embraces, in addition to direct application onto the pests, any other application in which compounds of the formula (I)' act on the pests. Such indirect applications can, for example, be the use of compounds which, for example in the soil, the plant or the pest, decompose or are degraded into compounds of the formula (I).

In addition to their lethal effect on pests, the compounds of the formula (I)' or their salts also have a pronounced repellent effect.

A repellent for the purpose of the description is a substance or substance mixture which has a warding-off or fending-off effect on other living beings, in particular harmful pests and nuisance pests. The term also encompasses effects such as the antifeeding effect, where the intake of feed is disturbed or prevented (antifeedant effect), suppression of oviposition, or an effect on the development of the population.

The invention therefore also provides the use of compounds of the formula (I)' or their salts for achieving the abovementioned effects, in particular in the case of the pests stated in the biological examples.

The invention also provides a method for fending off, or warding off, harmful organisms, where one or more compounds of the formula (I)' or their salts are applied to the site from which the harmful organisms are to be fended off or warded off.

In the case of a plant, application may mean, for example, a treatment of the plant, but also of the seed.

As regards the effect on populations, it is interesting to note that effects can also be observed in succession during the development of a population, where summation may take place. In such a case, the individual effect itself may only have an efficacy

of markedly less than 100% but in total an efficacy of 100% is still achieved in the end.

Moreover, the compounds of the formula (I) or their salts are distinguished by the fact that the composition is usually applied earlier than in the case of a direct control, if the abovementioned effects are to be exploited. The effect frequently lasts over a long period, so that a duration of action of over 2 months is achieved.

The effects are observed in insects, arachnids and the other abovementioned pests.

Express reference is made to the contents of the German patent application 103 46 245.7, whose priority the present application claims, and the abstract involved; it is incorporated into this description by reference.

The invention is explained in detail by the examples without restricting it thereby.

Examples

A Chemical examples

General method

One equivalent of amide, one equivalent of sodium methanolate and one equivalent of the compound of the formula (III) are heated in NMP at 60 - 70°C under 100 mbar for 1 - 3 hours.

Example 1

Preparation of allyl ethoxy-N-ethylcarbamate

1.0 mol of hydroxylammonium chloride was introduced into 600 ml of water. At 15 to 20°C, 1.1 mol of NaOH were added dropwise as 45 % by weight solution until a pH of 7.5 was reached. Then, at 15-25°C and a pH of 7-8, simultaneously 1.0 mol of

allyl chloroformate and 1.0 mol of NaOH were added dropwise. After the addition was complete, the pH was adjusted to 11 and then 3.0 mol of diethyl sulfate were added over the course of 3 h, keeping the pH at 11 by adding NaOH. After the addition was complete, the mixture was stirred at 30-35°C and a pH of 11 for 2 h. The organic phase was separated off, the aqueous phase was extracted three times with ethyl acetate, and the combined organic phases were dried and then concentrated.

Yield 93% of theory, pale oil.

Preparation of compounds of table 1 and 2:

10% by weight hydrochloric acid is slowly added dropwise until pH 5 is reached. The reaction mixture is diluted with water, and the product is extracted with ethyl acetate. The organic phase is washed with H_2O and dried, and the solvent is removed in vacuo.

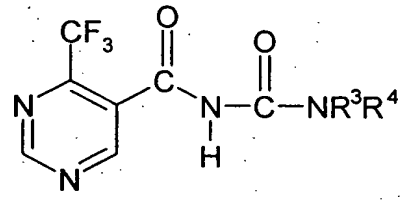
a) Preparation of compounds of table 3:

The resulting precipitate is filtered off and washed with methanol.

The following are obtained by the general method:

Table 1:

Compounds of the formula (Iaa)



(Iaa)

Compound	R^3	R^4
A-1	$CH_3CH=CHCH_2$	CH_3
A-2	$CH_2=C(CH_3)CH_2$	CH_3
A-3	$CH_2=CH(CH_3)CH$	CH_3
A-4	$CH_2=CHCH_2CH_2$	CH_3
A-5	$CH_3CH=C(CH_3)CH_2$	CH_3
A-6	$CH(CH_3)HC=CHCH_3$	CH_3
A-7	$C(CH_3)_2HC=CH_2$	CH_3
A-8	$CH_2HC=C(CH_3)_2$	CH_3
A-9	$CH_3CH=CHCH_2CH_2$	CH_3
A-10	$CH_2=CHCH_2CH_2CH_2$	CH_3
A-11	$CHC\equiv CCH_2$	CH_3
A-12	$CH_3C\equiv CCH_2$	CH_3
A-13	$HC\equiv CCH(CH_3)$	CH_3
A-14	$CH_3C\equiv CCH(CH_3)$	CH_3
A-15	cyclo-C_3H_5	CH_3
A-16	cyclo-C_5H_9	CH_3
A-17	cyclo-C_6H_{11}	CH_3
A-18	(cyclo-C_3H_5)CH_2	CH_3
A-19	(cyclo-C_5H_9)CH_2	CH_3
A-20	(cyclo-C_6H_{11})CH_2	CH_3
A-21	$PhCH_2$	CH_3
A-22	$PhCH(CH_3)$	CH_3
A-23	$PhC(CH_3)_2$	CH_3

Compound	R^3	R^4
A-24	$PhCH_2CH_2$	CH_3
A-25	(2-F-Ph)CH_2	CH_3
A-26	(3-F-Ph)CH_2	CH_3
A-27	(4-F-Ph)CH_2	CH_3
A-28	(2-Cl-Ph)CH_2	CH_3
A-29	(3-Cl-Ph)CH_2	CH_3
A-30	(4-Cl-Ph)CH_2	CH_3
A-31	(2-CF_3-Ph)CH_2	CH_3
A-32	(3-CF_3-Ph)CH_2	CH_3
A-33	(4-CF_3-Ph)CH_2	CH_3
A-34	(2-CH_3O-Ph)CH_2	CH_3
A-35	(3-CH_3O-Ph)CH_2	CH_3
A-36	(4-CH_3O-Ph)CH_2	CH_3
A-37	CH_3O	CH_3
A-38	CH_3CH_2O	CH_3
A-39	n-C_3H_7O	CH_3
A-40	iso-C_3H_7O	CH_3
A-41	CH_2=$CHCH_2O$	CH_3
A-42	CH_2=$C(CH_3)CH_2O$	CH_3
A-43	CH_2=$CHCH(CH_3)O$	CH_3
A-44	CH_2=$CHCH(CH_3)O$	CH_3
A-45	CH_2=$CHC(CH_3)_2O$	CH_3
A-46	CH_3CH=$CHCH_2O$	CH_3
A-47	HC≡CCH_2O	CH_3
A-48	CH_3C≡CCH_2O	CH_3
A-49	HC≡$CCH(CH_3)O$	CH_3
A-50	$CH_3O_2CCH(CH_3)O$	CH_3
A-51	$CH_3O_2CC(CH_3)_2O$	CH_3
A-52	$CH_3O_2CCH_2O$	CH_3
A-53	$PhCH_2O$	CH_3
A-54	PhO	CH_3
A-55	Ph	CH_3
A-56	2-F-Ph	CH_3

Compound	R^3	R^4
A-57	3-F-Ph	CH_3
A-58	4-F-Ph	CH_3
A-59	2-Cl-Ph	CH_3
A-60	3-Cl-Ph	CH_3
A-61	4-Cl-Ph	CH_3
A-62	2-Br-Ph	CH_3
A-63	3-Br-Ph	CH_3
A-64	4-Br-Ph	CH_3
A-65	2-I-Ph	CH_3
A-66	3-I-Ph	CH_3
A-67	4-I-Ph	CH_3
A-68	2-CF_3-Ph	CH_3
A-69	3-CF_3-Ph	CH_3
A-70	4-CF_3-Ph	CH_3
A-71	2-CH_3-Ph	CH_3
A-72	3-CH_3-Ph	CH_3
A-73	4-CH_3-Ph	CH_3
A-74	2-CH_3O-Ph	CH_3
A-75	3-CH_3O-Ph	CH_3
A-76	4-CH_3O-Ph	CH_3
A-77	2-NO_2-Ph	CH_3
A-78	3-NO_2-Ph	CH_3
A-79	4-NO_2-Ph	CH_3
A-80	2-CN-Ph	CH_3
A-81	3-CN-Ph	CH_3
A-82	4-CN-Ph	CH_3
A-83	2-CO_2Me-Ph	CH_3
A-84	3-CO_2Me-Ph	CH_3
A-85	4-CO_2Me-Ph	CH_3
A-86	2-CF_3O-Ph	CH_3
A-87	3-CF_3O-Ph	CH_3
A-88	4-CF_3O-Ph	CH_3
A-89	4-CF_3CH_2O-Ph	CH_3

Compound	R^3	R^4
A-90	4-(4-Cl-PhO)-Ph	CH_3
A-91	4-(4-CF_3-PhO)-Ph	CH_3
A-92	2,3-diCl-Ph	CH_3
A-93	2,4-diCl-Ph	CH_3
A-94	2,5-diCl-Ph	CH_3
A-95	2,6-diCl-Ph	CH_3
A-96	3,4-diCl-Ph	CH_3
A-97	3,5-diCl-Ph	CH_3
A-98	2-Pyridyl	CH_3
A-99	3-Pyridyl	CH_3
A-100	4-Pyridyl	CH_3
A-101	2-Pyrimidyl	CH_3
A-102	1-Pyrrolyl	CH_3
A-103	1-Pyrazolyl	CH_3
A-104	3-Pyrazolyl	CH_3
A-105	1,2,4-Triazol-1-yl	CH_3
A-106	1,2,4-Triazol-3-yl	CH_3
A-107	2-Furanyl	CH_3
A-108	3-Furanyl	CH_3
A-109	2-Thienyl	CH_3
A-110	3-Thienyl	CH_3
A-111	2-Thiazolyl	CH_3
A-112	1,3,4-Thiadiazol-2-yl	CH_3
A-113	3-Isoxazolyl	CH_3
A-114	CF_3CH_2	CH_3
A-115	$ClCH_2CH_2$	CH_3
A-116	$ClCH_2CH_2CH_2$	CH_3
A-117	$CH_3OCH_2CH_2$	CH_3
A-118	$CH_3CH_2OCH_2CH_2$	CH_3
A-119	$CH_3OCH_2CH_2CH_2$	CH_3
A-120	$C_2H_5OCH_2CH_2CH_2$	CH_3
A-121	n-$C_4H_9OCH_2CH_2CH_2$	CH_3
A-122	$(CH_3O)_2CHCH_2$	CH_3

Compound	R^3	R^4
A-123	$(CH_3O)_2C=CH_2$	CH_3
A-124	$(CH_3O_2)C=CH(CH_3)$	CH_3
A-125	$CH_3O_2CC(CH_3)_2$	CH_3
A-126	$NCCH_2$	CH_3
A-127	$NC(CH_3)(iso\text{-}C_3H_7)C$	CH_3
A-128	$(1\text{-pyrrolidinyl})CH_2CH_2$	C_2H_5
A-129	$CH_2=CHCH_2$	C_2H_5
A-130	$CHC=CH_2$	C_2H_5
A-131	$CH_3C\equiv CCH_2$	C_2H_5
A-132	$(cyclo\text{-}C_3H_5)CH_2$	C_2H_5
A-133	$PhCH_2$	C_2H_5
A-134	$PhCH_2CH_2$	C_2H_5
A-135	$(2\text{-Cl-Ph})CH_2$	C_2H_5
A-136	$(3\text{-Cl-Ph})CH_2$	C_2H_5
A-137	$(4\text{-Cl-Ph})CH_2$	C_2H_5
A-138	$(2\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
A-139	$(3\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
A-140	$(4\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
A-141	$(2\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
A-142	$(3\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
A-143	$(4\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
A-144	CH_3O	C_2H_5
A-145	CH_3CH_2O	C_2H_5
A-146	$n\text{-}C_3H_7O$	C_2H_5
A-147	$iso\text{-}C_3H_7O$	C_2H_5
A-148	$CH_2=CHCH_2O$	C_2H_5
A-149	$HC\equiv CCH_2O$	C_2H_5
A-150	$PhCH_2O$	C_2H_5
A-151	PhO	C_2H_5
A-152	Ph	C_2H_5
A-153	2-Cl-Ph	C_2H_5
A-154	3-Cl-Ph	C_2H_5
A-155	4-Cl-Ph	C_2H_5

Compound	R^3	R^4
A-156	2-CF_3-Ph	C_2H_5
A-157	3-CF_3-Ph	C_2H_5
A-158	4-CF_3-Ph	C_2H_5
A-159	2-CH_3O-Ph	C_2H_5
A-160	3-CH_3O-Ph	C_2H_5
A-161	4-CH_3O-Ph	C_2H_5
A-162	4-CF_3O-Ph	C_2H_5
A-163	4-CF_3CH_2O-Ph	C_2H_5
A-164	4-(4-Cl-PhO)-Ph	C_2H_5
A-165	4-(4-CF_3-PhO)-Ph	C_2H_5
A-166	2,3-diCl-Ph	C_2H_5
A-167	1-Pyrrolyl	C_2H_5
A-168	1-Pyrazolyl	C_2H_5
A-169	1,2,4-Triazol-1-yl	C_2H_5
A-170	2-Thiazolyl	C_2H_5
A-171	1,3,4-Thiadiazol-2-yl	C_2H_5
A-172	$CH_3O_2CCH_2$	C_2H_5
A-173	$CH_3O_2CCH(CH_3)$	C_2H_5
A-174	$NCCH_2$	n-C_3H_7
A-175	CH_2=$CHCH_2$	iso-C_3H_7
A-176	HC≡CCH_2	iso-C_3H_7
A-177	CH_3C≡CCH_2	iso-C_3H_7
A-178	(cyclo-C_3H_5)CH_2	iso-C_3H_7
A-179	$PhCH_2$	iso-C_3H_7
A-180	$PhCH_2CH_2$	iso-C_3H_7
A-181	(2-Cl-Ph)CH_2	iso-C_3H_7
A-182	(3-Cl-Ph)CH_2	iso-C_3H_7
A-183	(4-Cl-Ph)CH_2	iso-C_3H_7
A-184	(2-CF_3-Ph)CH_2	iso-C_3H_7
A-185	(3-CF_3-Ph)CH_2	iso-C_3H_7
A-186	(4-CF_3-Ph)CH_2	iso-C_3H_7
A-187	(2-CH_3O-Ph)CH_2	iso-C_3H_7
A-188	(3-CH_3O-Ph)CH_2	iso-C_3H_7

Compound	R^3	R^4
A-189	(4-CH_3O-Ph)CH_2	iso-C_3H_7
A-190	CH_3O	iso-C_3H_7
A-191	CH_3CH_2O	iso-C_3H_7
A-192	n-C_3H_7O	iso-C_3H_7
A-193	iso-C_3H_7O	iso-C_3H_7
A-194	CH_2=$CHCH_2O$	iso-C_3H_7
A-195	HC≡CCH_2O	iso-C_3H_7
A-196	$PhCH_2O$	iso-C_3H_7
A-197	PhO	iso-C_3H_7
A-198	Ph	iso-C_3H_7
A-199	2-Cl-Ph	iso-C_3H_7
A-200	3-Cl-Ph	iso-C_3H_7
A-201	4-Cl-Ph	iso-C_3H_7
A-202	2-CF_3-Ph	iso-C_3H_7
A-203	3-CF_3-Ph	iso-C_3H_7
A-204	4-CF_3-Ph	iso-C_3H_7
A-205	2-CH_3O-Ph	iso-C_3H_7
A-206	3-CH_3O-Ph	iso-C_3H_7
A-207	4-CH_3O-Ph	iso-C_3H_7
A-208	4-CF_3O-Ph	iso-C_3H_7
A-209	4-CF_3CH_2O-Ph	iso-C_3H_7
A-210	4-(4-Cl-PhO)-Ph	iso-C_3H_7
A-211	4-(4-CF_3-PhO)-Ph	iso-C_3H_7
A-212	2,3-diCl-Ph	iso-C_3H_7
A-213	1-Pyrrolyl	iso-C_3H_7
A-214	1-Pyrazolyl	iso-C_3H_7
A-215	1,2,4-Triazol-1-yl	iso-C_3H_7
A-216	2-Thiazolyl	iso-C_3H_7
A-217	1,3,4-Thiadiazol-2-yl	iso-C_3H_7
A-218	CF_3CH_2	iso-C_3H_7
A-219	$ClCH_2CH_2$	iso-C_3H_7
A-220	$ClCH_2CH_2CH_2$	iso-C_3H_7
A-221	$CH_3OCH_2CH_2$	iso-C_3H_7

Compound	R^3	R^4
A-222	$CH_3CH_2OCH_2CH_2$	iso-C_3H_7
A-223	$CH_3OCH_2CH_2CH_2$	iso-C_3H_7
A-224	$C_2H_5OCH_2CH_2CH_2$	iso-C_3H_7
A-225	n-$C_4H_9OCH_2CH_2CH_2$	iso-C_3H_7
A-226	$(CH_3O)_2CHCH_2$	iso-C_3H_7
A-227	$CH_3O_2CCH_2$	iso-C_3H_7
A-228	$CH_3O_2CCH(CH_3)$	iso-C_3H_7
A-229	$NCCH_2$	iso-C_3H_7
A-230	$NC(CH_3)$(iso-C_3H_7)	tert-C_4H_9
A-231	CH_2=$CHCH_2$	tert-C_4H_9
A-232	$CHCCH_2$	tert-C_4H_9
A-233	CH_3CCCH_2	tert-C_4H_9
A-234	(cyclo-C_3H_5)CH_2	tert-C_4H_9
A-235	$PhCH_2$	tert-C_4H_9
A-236	$PhCH_2CH_2$	tert-C_4H_9
A-237	(2-Cl-Ph)CH_2	tert-C_4H_9
A-238	(3-Cl-Ph)CH_2	tert-C_4H_9
A-239	(4-Cl-Ph)CH_2	tert-C_4H_9
A-240	(2-CF_3-Ph)CH_2	tert-C_4H_9
A-241	(3-CF_3-Ph)CH_2	tert-C_4H_9
A-242	(4-CF_3-Ph)CH_2	tert-C_4H_9
A-243	(2-CH_3O-Ph)CH_2	tert-C_4H_9
A-244	(3-CH_3O-Ph)CH_2	tert-C_4H_9
A-245	(4-CH_3O-Ph)CH_2	tert-C_4H_9
A-246	CH_3O	tert-C_4H_9
A-247	CH_3CH_2O	tert-C_4H_9
A-248	n-C_3H_7O	tert-C_4H_9
A-249	iso-C_3H_7O	tert-C_4H_9
A-250	CH_2=$CHCH_2O$	tert-C_4H_9
A-251	$HC{\equiv}CCH_2O$	tert-C_4H_9
A-252	$PhCH_2O$	tert-C_4H_9
A-253	PhO	tert-C_4H_9
A-254	Ph	tert-C_4H_9

Compound	R^3	R^4
A-255	2-Cl-Ph	tert-C_4H_9
A-256	3-Cl-Ph	tert-C_4H_9
A-257	4-Cl-Ph	tert-C_4H_9
A-258	2-CF_3-Ph	tert-C_4H_9
A-259	3-CF_3-Ph	tert-C_4H_9
A-260	4-CF_3-Ph	tert-C_4H_9
A-261	2-CH_3O-Ph	tert-C_4H_9
A-262	3-CH_3O-Ph	tert-C_4H_9
A-263	4-CH_3O-Ph	tert-C_4H_9
A-264	4-CF_3O-Ph	tert-C_4H_9
A-265	4-CF_3CH_2O-Ph	tert-C_4H_9
A-266	4-(4-Cl-PhO)-Ph	tert-C_4H_9
A-267	4-(4-CF_3-PhO)-Ph	tert-C_4H_9
A-268	2,3-diCl-Ph	tert-C_4H_9
A-269	1-Pyrrolyl	tert-C_4H_9
A-270	1-Pyrazolyl	tert-C_4H_9
A-271	1,2,4-Triazol-1-yl	tert-C_4H_9
A-272	2-Thiazolyl	tert-C_4H_9
A-273	1,3,4-Thiadiazol-2-yl	tert-C_4H_9
A-274	$CH_3O_2CCH_2$	tert-C_4H_9
A-275	$CH_3O_2CCH(CH_3)$	tert-C_4H_9
A-276	$NCCH_2$	tert-C_4H_9
A-277	$NC(CH_3)$(iso-C_3H_7)C	CH_2=$CHCH_2$
A-278	CH_2=$CHCH_2$	CH_2=$CHCH_2$
A-279	HC≡CCH_2	CH_2=$CHCH_2$
A-280	CH_3CCCH_2	CH_2=$CHCH_2$
A-281	(cyclo-C_3H_5)CH_2	CH_2=$CHCH_2$
A-282	$PhCH_2$	CH_2=$CHCH_2$
A-283	$PhCH_2CH_2$	CH_2=$CHCH_2$
A-284	(2-Cl-Ph)CH_2	CH_2=$CHCH_2$
A-285	(3-Cl-Ph)CH_2	CH_2=$CHCH_2$
A-286	(4-Cl-Ph)CH_2	CH_2=$CHCH_2$
A-287	(2-CF_3-Ph)CH_2	CH_2=$CHCH_2$

Compound	R^3	R^4
A-288	(3-CF_3-Ph)CH_2	CH_2=$CHCH_2$
A-289	(4-CF_3-Ph)CH_2	CH_2=$CHCH_2$
A-290	(2-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
A-291	(3-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
A-292	(4-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
A-293	CH_3O	CH_2=$CHCH_2$
A-294	CH_3CH_2O	CH_2=$CHCH_2$
A-295	n-C_3H_7O	CH_2=$CHCH_2$
A-296	iso-C_3H_7O	CH_2=$CHCH_2$
A-297	CH_2=$CHCH_2O$	CH_2=$CHCH_2$
A-298	$CHCCH_2O$	CH_2=$CHCH_2$
A-299	$PhCH_2O$	CH_2=$CHCH_2$
A-300	PhO	CH_2=$CHCH_2$
A-301	Ph	CH_2=$CHCH_2$
A-302	2-Cl-Ph	CH_2=$CHCH_2$
A-303	3-Cl-Ph	CH_2=$CHCH_2$
A-304	4-Cl-Ph	CH_2=$CHCH_2$
A-305	2-CF_3-Ph	CH_2=$CHCH_2$
A-306	3-CF_3-Ph	CH_2=$CHCH_2$
A-307	4-CF_3-Ph	CH_2=$CHCH_2$
A-308	2-CH_3O-Ph	CH_2=$CHCH_2$
A-309	3-CH_3O-Ph	CH_2=$CHCH_2$
A-310	4-CH_3O-Ph	CH_2=$CHCH_2$
A-311	4-CF_3O-Ph	CH_2=$CHCH_2$
A-312	4-CF_3CH_2O-Ph	CH_2=$CHCH_2$
A-313	4-(4-Cl-PhO)-Ph	CH_2=$CHCH_2$
A-314	4-(4-CF_3-PhO)-Ph	CH_2=$CHCH_2$
A-315	2,3-diCl-Ph	CH_2=$CHCH_2$
A-316	1-Pyrrolyl	CH_2=$CHCH_2$
A-317	1-Pyrazolyl	CH_2=$CHCH_2$
A-318	1,2,4-Triazol-1-yl	CH_2=$CHCH_2$
A-319	2-Thiazolyl	CH_2=$CHCH_2$
A-320	1,3,4-Thiadiazol-2-yl	CH_2=$CHCH_2$

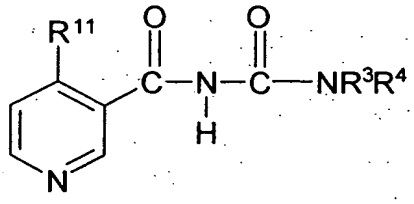
Compound	R^3	R^4
A-321	CF_3CH_2	$CH_2=CHCH_2$
A-322	$ClCH_2CH_2$	$CH_2=CHCH_2$
A-323	$ClCH_2CH_2CH_2$	$CH_2=CHCH_2$
A-324	$CH_3OCH_2CH_2$	$CH_2=CHCH_2$
A-325	$CH_3CH_2OCH_2CH_2$	$CH_2=CHCH_2$
A-326	$CH_3OCH_2CH_2CH_2$	$CH_2=CHCH_2$
A-327	$C_2H_5OCH_2CH_2CH_2$	$CH_2=CHCH_2$
A-328	n-$C4H_9OCH_2CH_2CH_2$	$CH_2=CHCH_2$
A-329	$(CH_3O)_2CHCH_2$	$CH_2=CHCH_2$
A-330	$CH_3O_2CCH_2$	$CH_2=CHCH_2$
A-331	$CH_3O_2CCH(CH_3)$	$CH_2=CHCH_2$
A-332	$NCCH_2$	$CH_2=CHCH_2$
A-333	$NC(CH_3)$(iso-C_3H_7)C	$PhCH_2$
A-334	$CH_2=CHCH_2$	$PhCH_2$
A-335	$HC\equiv CCH_2$	$PhCH_2$
A-336	$CH_3C\equiv CCH_2$	$PhCH_2$
A-337	(cyclo-C_3H_5)CH_2	$PhCH_2$
A-338	$PhCH_2$	$PhCH_2$
A-339	$PhCH_2CH_2$	$PhCH_2$
A-340	(2-Cl-Ph)CH_2	$PhCH_2$
A-341	(3-Cl-Ph)CH_2	$PhCH_2$
A-342	(4-Cl-Ph)CH_2	$PhCH_2$
A-343	(2-CF_3-Ph)CH_2	$PhCH_2$
A-344	(3-CF_3-Ph)CH_2	$PhCH_2$
A-345	(4-CF_3-Ph)CH_2	$PhCH_2$
A-346	(2-CH_3O-Ph)CH_2	$PhCH_2$
A-347	(3-CH_3O-Ph)CH_2	$PhCH_2$
A-348	(4-CH_3O-Ph)CH_2	$PhCH_2$
A-349	CH_3O	$PhCH_2$
A-350	CH_3CH_2O	$PhCH_2$
A-351	n-C_3H_7O	$PhCH_2$
A-352	iso-C_3H_7O	$PhCH_2$
A-353	$CH_2=CHCH_2O$	$PhCH_2$

Compound	R^3	R^4
A-354	$CHCCH_2O$	$PhCH_2$
A-355	$PhCH_2O$	$PhCH_2$
A-356	PhO	$PhCH_2$
A-357	Ph	$PhCH_2$
A-358	2-Cl-Ph	$PhCH_2$
A-359	3-Cl-Ph	$PhCH_2$
A-360	4-Cl-Ph	$PhCH_2$
A-361	2-CF_3-Ph	$PhCH_2$
A-362	3-CF_3-Ph	$PhCH_2$
A-363	4-CF_3-Ph	$PhCH_2$
A-364	2-CH_3O-Ph	$PhCH_2$
A-365	3-CH_3O-Ph	$PhCH_2$
A-366	4-CH_3O-Ph	$PhCH_2$
A-367	4-CF_3O-Ph	$PhCH_2$
A-368	4-CF_3CH_2O-Ph	$PhCH_2$
A-369	4-(4-Cl-PhO)-Ph	$PhCH_2$
A-370	4-(4-CF_3-PhO)-Ph	$PhCH_2$
A-371	2,3-diCl-Ph	$PhCH_2$
A-372	1-Pyrrolyl	$PhCH_2$
A-373	1-Pyrazolyl	$PhCH_2$
A-374	1,2,4-Triazol-1-yl	$PhCH_2$
A-375	2-Thiazolyl	$PhCH_2$
A-376	1,3,4-Thiadiazol-2-yl	$PhCH_2$
A-377	CF_3CH_2	$PhCH_2$
A-378	$ClCH_2CH_2$	$PhCH_2$
A-379	$ClCH_2CH_2CH_2$	$PhCH_2$
A-380	$CH_3OCH_2CH_2$	$PhCH_2$
A-381	$CH_3CH_2OCH_2CH_2$	$PhCH_2$
A-382	$CH_3OCH_2CH_2CH_2$	$PhCH_2$
A-383	$C_2H_5OCH_2CH_2CH_2$	$PhCH_2$
A-384	n-$C_4H_9OCH_2CH_2CH_2$	$PhCH_2$
A-385	$(CH_3O)_2CHCH_2$	$PhCH_2$
A-386	$CH(CH_3)CH_2CH_2CH_2CH_2$	

Compound	R^3	R^4
A-387	$CH_2CHBrCH_2CH_2$	
A-388	$CH_2CH(OH)CH_2CH_2$	
A-389	$CH_2CH=CHCH_2$	
A-390	Ph	Ph
A-391	$CH_3SO_2OCH_2CH_2CH_2CH_2$	H
A-392	$CH_2CH_2CH_2CH_2CH_2$	
A-393	$CH_2CH_2OCH_2CH_2$	
A-394	$CH_2CH_2SCH_2CH_2$	
A-395	$CH_2CH_2NHCH_2CH_2$	
A-396	$CH_2CH_2N(CH_3)CH_2CH_2$	
A-397	$N=CHCH_2CH_2$	

Table 2

Compounds of the formula (Ibb)



(Ibb)

R^{11} = CHF_2 (compounds B1 - B 397) or CF_2Cl (compounds C1 - C 397)

Compound	R^3	R^4
B-1 / C-1	$CH_3CH=CHCH_2$	CH_3
B-1 / C-2	$CH_2=C(CH_3)CH_2$	CH_3
B-1 / C-3	$CH_2=CH(CH_3)CH$	CH_3
B-1 / C-4	$CH_2=CHCH_2CH_2$	CH_3
B-1 / C-5	$CH_3CH=C(CH_3)CH_2$	CH_3
B-1 / C-6	$CH(CH_3)HC=CHCH_3$	CH_3
B-1 / C-7	$C(CH_3)_2HC=CH_2$	CH_3
B-1 / C-8	$CH_2HC=C(CH_3)_2$	CH_3
B-1 / C-9	$CH_3CH=CHCH_2CH_2$	CH_3
B-1 / C- 10	$CH_2=CHCH_2CH_2CH_2$	CH_3
B-1 / C- 11	$CHC\equiv CCH_2$	CH_3
B-1 / C- 12	$CH_3C\equiv CCH_2$	CH_3
B-1 / C- 13	$HC\equiv CCH(CH_3)$	CH_3
B-1 / C- 14	$CH_3C\equiv CCH(CH_3)$	CH_3
B-1 / C- 15	cyclo-C_3H_5	CH_3
B-1 / C- 16	cyclo-C_5H_9	CH_3
B-1 / C- 17	cyclo-C_6H_{11}	CH_3
B-1 / C- 18	(cyclo-C_3H_5)CH_2	CH_3
B-1 / C- 19	(cyclo-C_5H_9)CH_2	CH_3
B-1 / C- 20	(cyclo-C_6H_{11})CH_2	CH_3
B-1 / C- 21	$PhCH_2$	CH_3

Compound	R^3	R^4
B-1 / C- 22	$PhCH(CH_3)$	CH_3
B-1 / C- 23	$PhC(CH_3)_2$	CH_3
B-1 / C- 24	$PhCH_2CH_2$	CH_3
B-1 / C- 25	$(2\text{-F-Ph})CH_2$	CH_3
B-1 / C- 26	$(3\text{-F-Ph})CH_2$	CH_3
B-1 / C- 27	$(4\text{-F-Ph})CH_2$	CH_3
B-1 / C- 28	$(2\text{-Cl-Ph})CH_2$	CH_3
B-1 / C- 29	$(3\text{-Cl-Ph})CH_2$	CH_3
B-1 / C- 30	$(4\text{-Cl-Ph})CH_2$	CH_3
B-1 / C- 31	$(2\text{-}CF_3\text{-Ph})CH_2$	CH_3
B-1 / C- 32	$(3\text{-}CF_3\text{-Ph})CH_2$	CH_3
B-1 / C- 33	$(4\text{-}CF_3\text{-Ph})CH_2$	CH_3
B-1 / C- 34	$(2\text{-}CH_3O\text{-Ph})CH_2$	CH_3
B-1 / C- 35	$(3\text{-}CH_3O\text{-Ph})CH_2$	CH_3
B-1 / C- 36	$(4\text{-}CH_3O\text{-Ph})CH_2$	CH_3
B-1 / C- 37	CH_3O	CH_3
B-1 / C- 38	CH_3CH_2O	CH_3
B-1 / C- 39	$n\text{-}C_3H_7O$	CH_3
B-1 / C- 40	$iso\text{-}C_3H_7O$	CH_3
B-1 / C- 41	$CH_2=CHCH_2O$	CH_3
B-1 / C- 42	$CH_2=C(CH_3)CH_2O$	CH_3
B-1 / C- 43	$CH_2=CHCH(CH_3)O$	CH_3
B-1 / C- 44	$CH_2=CHCH(CH_3)O$	CH_3
B-1 / C- 45	$CH_2=CHC(CH_3)_2O$	CH_3
B-1 / C- 46	$CH_3CH=CHCH_2O$	CH_3
B-1 / C- 47	$HC\equiv CCH_2O$	CH_3
B-1 / C- 48	$CH_3C\equiv CCH_2O$	CH_3
B-1 / C- 49	$HC\equiv CCH(CH_3)O$	CH_3
B-1 / C- 50	$CH_3O_2CCH(CH_3)O$	CH_3
B-1 / C- 51	$CH_3O_2CC(CH_3)_2O$	CH_3
B-1 / C- 52	$CH_3O_2CCH_2O$	CH_3
B-1 / C- 53	$PhCH_2O$	CH_3
B-1 / C- 54	PhO	CH_3

Compound	R^3	R^4
B-1 / C- 55	Ph	CH_3
B-1 / C- 56	2-F-Ph	CH_3
B-1 / C- 57	3-F-Ph	CH_3
B-1 / C- 58	4-F-Ph	CH_3
B-1 / C- 59	2-Cl-Ph	CH_3
B-1 / C- 60	3-Cl-Ph	CH_3
B-1 / C- 61	4-Cl-Ph	CH_3
B-1 / C- 62	2-Br-Ph	CH_3
B-1 / C- 63	3-Br-Ph	CH_3
B-1 / C- 64	4-Br-Ph	CH_3
B-1 / C- 65	2-I-Ph	CH_3
B-1 / C- 66	3-I-Ph	CH_3
B-1 / C- 67	4-I-Ph	CH_3
B-1 / C- 68	2-CF_3-Ph	CH_3
B-1 / C- 69	3-CF_3-Ph	CH_3
B-1 / C- 70	4-CF_3-Ph	CH_3
B-1 / C- 71	2-CH_3-Ph	CH_3
B-1 / C- 72	3-CH_3-Ph	CH_3
B-1 / C- 73	4-CH_3-Ph	CH_3
B-1 / C- 74	2-CH_3O-Ph	CH_3
B-1 / C- 75	3-CH_3O-Ph	CH_3
B-1 / C- 76	4-CH_3O-Ph	CH_3
B-1 / C- 77	2-NO_2-Ph	CH_3
B-1 / C- 78	3-NO_2-Ph	CH_3
B-1 / C- 79	4-NO_2-Ph	CH_3
B-1 / C- 80	2-CN-Ph	CH_3
B-1 / C- 81	3-CN-Ph	CH_3
B-1 / C- 82	4-CN-Ph	CH_3
B-1 / C- 83	2-CO_2Me-Ph	CH_3
B-1 / C- 84	3-CO_2Me-Ph	CH_3
B-1 / C- 85	4-CO_2Me-Ph	CH_3
B-1 / C- 86	2-CF_3O-Ph	CH_3
B-1 / C- 87	3-CF_3O-Ph	CH_3

Compound	R^3	R^4
B-1 / C- 88	4-CF_3O-Ph	CH_3
B-1 / C- 89	4-CF_3CH_2O-Ph	CH_3
B-1 / C- 90	4-(4-Cl-PhO)-Ph	CH_3
B-1 / C- 91	4-(4-CF_3-PhO)-Ph	CH_3
B-1 / C- 92	2,3-diCl-Ph	CH_3
B-1 / C- 93	2,4-diCl-Ph	CH_3
B-1 / C- 94	2,5-diCl-Ph	CH_3
B-1 / C- 95	2,6-diCl-Ph	CH_3
B-1 / C- 96	3,4-diCl-Ph	CH_3
B-1 / C- 97	3,5-diCl-Ph	CH_3
B-1 / C- 98	2-Pyridyl	CH_3
B-1 / C- 99	3-Pyridyl	CH_3
B-1 / C- 100	4-Pyridyl	CH_3
B-1 / C- 101	2-Pyrimidyl	CH_3
B-1 / C- 102	1-Pyrrolyl	CH_3
B-1 / C- 103	1-Pyrazolyl	CH_3
B-1 / C- 104	3-Pyrazolyl	CH_3
B-1 / C- 105	1,2,4-Triazol-1-yl	CH_3
B-1 / C- 106	1,2,4-Triazol-3-yl	CH_3
B-1 / C- 107	2-Furanyl	CH_3
B-1 / C- 108	3-Furanyl	CH_3
B-1 / C- 109	2-Thienyl	CH_3
B-1 / C- 110	3-Thienyl	CH_3
B-1 / C- 111	2-Thiazolyl	CH_3
B-1 / C- 112	1,3,4-Thiadiazol-2-yl	CH_3
B-1 / C- 113	3-Isoxazolyl	CH_3
B-1 / C- 114	CF_3CH_2	CH_3
B-1 / C- 115	$ClCH_2CH_2$	CH_3
B-1 / C- 116	$ClCH_2CH_2CH_2$	CH_3
B-1 / C- 117	$CH_3OCH_2CH_2$	CH_3
B-1 / C- 118	$CH_3CH_2OCH_2CH_2$	CH_3
B-1 / C- 119	$CH_3OCH_2CH_2CH_2$	CH_3
B-1 / C- 120	$C_2H_5OCH_2CH_2CH_2$	CH_3

Compound	R^3	R^4
B-1 / C- 121	n-$C_4H_9OCH_2CH_2CH_2$	CH_3
122	$(CH_3O)_2CHCH_2$	CH_3
123	$(CH_3O)_2C=CH_2$	CH_3
124	$(CH_3O_2)C=CH(CH_3)$	CH_3
125	$CH_3O_2CC(CH_3)_2$	CH_3
126	$NCCH_2$	CH_3
127	$NC(CH_3)$(iso-C_3H_7)C	CH_3
128	(1-pyrrolidinyl)CH_2CH_2	C_2H_5
129	$CH_2=CHCH_2$	C_2H_5
130	$CHC=CH_2$	C_2H_5
131	$CH_3C\equiv CCH_2$	C_2H_5
132	(cyclo-C_3H_5)CH_2	C_2H_5
133	$PhCH_2$	C_2H_5
134	$PhCH_2CH_2$	C_2H_5
135	(2-Cl-Ph)CH_2	C_2H_5
136	(3-Cl-Ph)CH_2	C_2H_5
137	(4-Cl-Ph)CH_2	C_2H_5
138	(2-CF_3-Ph)CH_2	C_2H_5
139	(3-CF_3-Ph)CH_2	C_2H_5
140	(4-CF_3-Ph)CH_2	C_2H_5
141	(2-CH_3O-Ph)CH_2	C_2H_5
142	(3-CH_3O-Ph)CH_2	C_2H_5
143	(4-CH_3O-Ph)CH_2	C_2H_5
144	CH_3O	C_2H_5
145	CH_3CH_2O	C_2H_5
146	n-C_3H_7O	C_2H_5
147	iso-C_3H_7O	C_2H_5
148	$CH_2=CHCH_2O$	C_2H_5
149	$HC\equiv CCH_2O$	C_2H_5
150	$PhCH_2O$	C_2H_5
151	PhO	C_2H_5
152	Ph	C_2H_5
153	2-Cl-Ph	C_2H_5

Compound	R^3	R^4
B-1 / C- 154	3-Cl-Ph	C_2H_5
B-1 / C- 155	4-Cl-Ph	C_2H_5
B-1 / C- 156	2-CF_3-Ph	C_2H_5
B-1 / C- 157	3-CF_3-Ph	C_2H_5
B-1 / C- 158	4-CF_3-Ph	C_2H_5
B-1 / C- 159	2-CH_3O-Ph	C_2H_5
B-1 / C- 160	3-CH_3O-Ph	C_2H_5
B-1 / C- 161	4-CH_3O-Ph	C_2H_5
B-1 / C- 162	4-CF_3O-Ph	C_2H_5
B-1 / C- 163	4-CF_3CH_2O-Ph	C_2H_5
B-1 / C- 164	4-(4-Cl-PhO)-Ph	C_2H_5
B-1 / C- 165	4-(4-CF_3-PhO)-Ph	C_2H_5
B-1 / C- 166	2,3-diCl-Ph	C_2H_5
B-1 / C- 167	1-Pyrrolyl	C_2H_5
B-1 / C- 168	1-Pyrazolyl	C_2H_5
B-1 / C- 169	1,2,4-Triazol-1-yl	C_2H_5
B-1 / C- 170	2-Thiazolyl	C_2H_5
B-1 / C- 171	1,3,4-Thiadiazol-2-yl	C_2H_5
B-1 / C- 172	$CH_3O_2CCH_2$	C_2H_5
B-1 / C- 173	$CH_3O_2CCH(CH_3)$	C_2H_5
B-1 / C- 174	$NCCH_2$	n-C_3H_7
B-1 / C- 175	CH_2=$CHCH_2$	iso-C_3H_7
B-1 / C- 176	HC≡CCH_2	iso-C_3H_7
B-1 / C- 177	CH_3C≡CCH_2	iso-C_3H_7
B-1 / C- 178	(cyclo-C_3H_5)CH_2	iso-C_3H_7
B-1 / C- 179	$PhCH_2$	iso-C_3H_7
B-1 / C- 180	$PhCH_2CH_2$	iso-C_3H_7
B-1 / C- 181	(2-Cl-Ph)CH_2	iso-C_3H_7
B-1 / C- 182	(3-Cl-Ph)CH_2	iso-C_3H_7
B-1 / C- 183	(4-Cl-Ph)CH_2	iso-C_3H_7
B-1 / C- 184	(2-CF_3-Ph)CH_2	iso-C_3H_7
B-1 / C- 185	(3-CF_3-Ph)CH_2	iso-C_3H_7
B-1 / C- 186	(4-CF_3-Ph)CH_2	iso-C_3H_7

Compound	R^3	R^4
B-1 / C- 187	(2-CH_3O-Ph)CH_2	iso-C_3H_7
B-1 / C- 188	(3-CH_3O-Ph)CH_2	iso-C_3H_7
B-1 / C- 189	(4-CH_3O-Ph)CH_2	iso-C_3H_7
B-1 / C- 190	CH_3O	iso-C_3H_7
B-1 / C- 191	CH_3CH_2O	iso-C_3H_7
B-1 / C- 192	n-C_3H_7O	iso-C_3H_7
B-1 / C- 193	iso-C_3H_7O	iso-C_3H_7
B-1 / C- 194	CH_2=$CHCH_2O$	iso-C_3H_7
B-1 / C- 195	HC≡CCH_2O	iso-C_3H_7
B-1 / C- 196	$PhCH_2O$	iso-C_3H_7
B-1 / C- 197	PhO	iso-C_3H_7
B-1 / C- 198	Ph	iso-C_3H_7
B-1 / C- 199	2-Cl-Ph	iso-C_3H_7
B-1 / C- 200	3-Cl-Ph	iso-C_3H_7
B-1 / C- 201	4-Cl-Ph	iso-C_3H_7
B-1 / C- 202	2-CF_3-Ph	iso-C_3H_7
B-1 / C- 203	3-CF_3-Ph	iso-C_3H_7
B-1 / C- 204	4-CF_3-Ph	iso-C_3H_7
B-1 / C- 205	2-CH_3O-Ph	iso-C_3H_7
B-1 / C- 206	3-CH_3O-Ph	iso-C_3H_7
B-1 / C- 207	4-CH_3O-Ph	iso-C_3H_7
B-1 / C- 208	4-CF_3O-Ph	iso-C_3H_7
B-1 / C- 209	4-CF_3CH_2O-Ph	iso-C_3H_7
B-1 / C- 210	4-(4-Cl-PhO)-Ph	iso-C_3H_7
B-1 / C- 211	4-(4-CF_3-PhO)-Ph	iso-C_3H_7
B-1 / C- 212	2,3-diCl-Ph	iso-C_3H_7
B-1 / C- 213	1-Pyrrolyl	iso-C_3H_7
B-1 / C- 214	1-Pyrazolyl	iso-C_3H_7
B-1 / C- 215	1,2,4-Triazol-1-yl	iso-C_3H_7
B-1 / C- 216	2-Thiazolyl	iso-C_3H_7
B-1 / C- 217	1,3,4-Thiadiazol-2-yl	iso-C_3H_7
B-1 / C- 218	CF_3CH_2	iso-C_3H_7
B-1 / C- 219	$ClCH_2CH_2$	iso-C_3H_7

Compound	R^3	R^4
B-1 / C- 220	$ClCH_2CH_2CH_2$	iso-C_3H_7
B-1 / C- 221	$CH_3OCH_2CH_2$	iso-C_3H_7
B-1 / C- 222	$CH_3CH_2OCH_2CH_2$	iso-C_3H_7
B-1 / C- 223	$CH_3OCH_2CH_2CH_2$	iso-C_3H_7
B-1 / C- 224	$C_2H_5OCH_2CH_2CH_2$	iso-C_3H_7
B-1 / C- 225	n-$C_4H_9OCH_2CH_2CH_2$	iso-C_3H_7
B-1 / C- 226	$(CH_3O)_2CHCH_2$	iso-C_3H_7
B-1 / C- 227	$CH_3O_2CCH_2$	iso-C_3H_7
B-1 / C- 228	$CH_3O_2CCH(CH_3)$	iso-C_3H_7
B-1 / C- 229	$NCCH_2$	iso-C_3H_7
B-1 / C- 230	$NC(CH_3)$(iso-C_3H_7)	tert-C_4H_9
B-1 / C- 231	CH_2=$CHCH_2$	tert-C_4H_9
B-1 / C- 232	$CHCCH_2$	tert-C_4H_9
B-1 / C- 233	CH_3CCCH_2	tert-C_4H_9
B-1 / C- 234	(cyclo-C_3H_5)CH_2	tert-C_4H_9
B-1 / C- 235	$PhCH_2$	tert-C_4H_9
B-1 / C- 236	$PhCH_2CH_2$	tert-C_4H_9
B-1 / C- 237	(2-Cl-Ph)CH_2	tert-C_4H_9
B-1 / C- 238	(3-Cl-Ph)CH_2	tert-C_4H_9
B-1 / C- 239	(4-Cl-Ph)CH_2	tert-C_4H_9
B-1 / C- 240	(2-CF_3-Ph)CH_2	tert-C_4H_9
B-1 / C- 241	(3-CF_3-Ph)CH_2	tert-C_4H_9
B-1 / C- 242	(4-CF_3-Ph)CH_2	tert-C_4H_9
B-1 / C- 243	(2-CH_3O-Ph)CH_2	tert-C_4H_9
B-1 / C- 244	(3-CH_3O-Ph)CH_2	tert-C_4H_9
B-1 / C- 245	(4-CH_3O-Ph)CH_2	tert-C_4H_9
B-1 / C- 246	CH_3O	tert-C_4H_9
B-1 / C- 247	CH_3CH_2O	tert-C_4H_9
B-1 / C- 248	n-C_3H_7O	tert-C_4H_9
B-1 / C- 249	iso-C_3H_7O	tert-C_4H_9
B-1 / C- 250	CH_2=$CHCH_2O$	tert-C_4H_9
B-1 / C- 251	HC≡CCH_2O	tert-C_4H_9
B-1 / C- 252	$PhCH_2O$	tert-C_4H_9

Compound	R^3	R^4
B-1 / C- 253	PhO	tert-C_4H_9
B-1 / C- 254	Ph	tert-C_4H_9
B-1 / C- 255	2-Cl-Ph	tert-C_4H_9
B-1 / C- 256	3-Cl-Ph	tert-C_4H_9
B-1 / C- 257	4-Cl-Ph	tert-C_4H_9
B-1 / C- 258	2-CF_3-Ph	tert-C_4H_9
B-1 / C- 259	3-CF_3-Ph	tert-C_4H_9
B-1 / C- 260	4-CF_3-Ph	tert-C_4H_9
B-1 / C- 261	2-CH_3O-Ph	tert-C_4H_9
B-1 / C- 262	3-CH_3O-Ph	tert-C_4H_9
B-1 / C- 263	4-CH_3O-Ph	tert-C_4H_9
B-1 / C- 264	4-CF_3O-Ph	tert-C_4H_9
B-1 / C- 265	4-CF_3CH_2O-Ph	tert-C_4H_9
B-1 / C- 266	4-(4-Cl-PhO)-Ph	tert-C_4H_9
B-1 / C- 267	4-(4-CF_3-PhO)-Ph	tert-C_4H_9
B-1 / C- 268	2,3-diCl-Ph	tert-C_4H_9
B-1 / C- 269	1-Pyrrolyl	tert-C_4H_9
B-1 / C- 270	1-Pyrazolyl	tert-C_4H_9
B-1 / C- 271	1,2,4-Triazol-1-yl	tert-C_4H_9
B-1 / C- 272	2-Thiazolyl	tert-C_4H_9
B-1 / C- 273	1,3,4-Thiadiazol-2-yl	tert-C_4H_9
B-1 / C- 274	$CH_3O_2CCH_2$	tert-C_4H_9
B-1 / C- 275	$CH_3O_2CCH(CH_3)$	tert-C_4H_9
B-1 / C- 276	$NCCH_2$	tert-C_4H_9
B-1 / C- 277	$NC(CH_3)$(iso-C_3H_7)C	CH_2=$CHCH_2$
B-1 / C- 278	CH_2=$CHCH_2$	CH_2=$CHCH_2$
B-1 / C- 279	HC≡CCH_2	CH_2=$CHCH_2$
B-1 / C- 280	CH_3CCCH_2	CH_2=$CHCH_2$
B-1 / C- 281	(cyclo-C_3H_5)CH_2	CH_2=$CHCH_2$
B-1 / C- 282	$PhCH_2$	CH_2=$CHCH_2$
B-1 / C- 283	$PhCH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 284	(2-Cl-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 285	(3-Cl-Ph)CH_2	CH_2=$CHCH_2$

Compound	R^3	R^4
B-1 / C- 286	(4-Cl-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 287	(2-CF_3-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 288	(3-CF_3-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 289	(4-CF_3-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 290	(2-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 291	(3-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 292	(4-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
B-1 / C- 293	CH_3O	CH_2=$CHCH_2$
B-1 / C- 294	CH_3CH_2O	CH_2=$CHCH_2$
B-1 / C- 295	n-C_3H_7O	CH_2=$CHCH_2$
B-1 / C- 296	iso-C_3H_7O	CH_2=$CHCH_2$
B-1 / C- 297	CH_2=$CHCH_2O$	CH_2=$CHCH_2$
B-1 / C- 298	$CHCCH_2O$	CH_2=$CHCH_2$
B-1 / C- 299	$PhCH_2O$	CH_2=$CHCH_2$
B-1 / C- 300	PhO	CH_2=$CHCH_2$
B-1 / C- 301	Ph	CH_2=$CHCH_2$
B-1 / C- 302	2-Cl-Ph	CH_2=$CHCH_2$
B-1 / C- 303	3-Cl-Ph	CH_2=$CHCH_2$
B-1 / C- 304	4-Cl-Ph	CH_2=$CHCH_2$
B-1 / C- 305	2-CF_3-Ph	CH_2=$CHCH_2$
B-1 / C- 306	3-CF_3-Ph	CH_2=$CHCH_2$
B-1 / C- 307	4-CF_3-Ph	CH_2=$CHCH_2$
B-1 / C- 308	2-CH_3O-Ph	CH_2=$CHCH_2$
B-1 / C- 309	3-CH_3O-Ph	CH_2=$CHCH_2$
B-1 / C- 310	4-CH_3O-Ph	CH_2=$CHCH_2$
B-1 / C- 311	4-CF_3O-Ph	CH_2=$CHCH_2$
B-1 / C- 312	4-CF_3CH_2O-Ph	CH_2=$CHCH_2$
B-1 / C- 313	4-(4-Cl-PhO)-Ph	CH_2=$CHCH_2$
B-1 / C- 314	4-(4-CF_3-PhO)-Ph	CH_2=$CHCH_2$
B-1 / C- 315	2,3-diCl-Ph	CH_2=$CHCH_2$
B-1 / C- 316	1-Pyrrolyl	CH_2=$CHCH_2$
B-1 / C- 317	1-Pyrazolyl	CH_2=$CHCH_2$
B-1 / C- 318	1,2,4-Triazol-1-yl	CH_2=$CHCH_2$

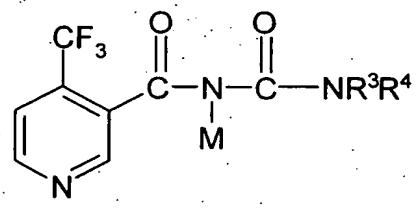
Compound	R^3	R^4
B-1 / C- 319	2-Thiazolyl	CH_2=$CHCH_2$
B-1 / C- 320	1,3,4-Thiadiazol-2-yl	CH_2=$CHCH_2$
B-1 / C- 321	CF_3CH_2	CH_2=$CHCH_2$
B-1 / C- 322	$ClCH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 323	$ClCH_2CH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 324	$CH_3OCH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 325	$CH_3CH_2OCH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 326	$CH_3OCH_2CH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 327	$C_2H_5OCH_2CH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 328	n-$C4H_9OCH_2CH_2CH_2$	CH_2=$CHCH_2$
B-1 / C- 329	$(CH_3O)_2CHCH_2$	CH_2=$CHCH_2$
B-1 / C- 330	$CH_3O_2CCH_2$	CH_2=$CHCH_2$
B-1 / C- 331	$CH_3O_2CCH(CH_3)$	CH_2=$CHCH_2$
B-1 / C- 332	$NCCH_2$	CH_2=$CHCH_2$
B-1 / C- 333	$NC(CH_3)$(iso-C_3H_7)C	$PhCH_2$
B-1 / C- 334	CH_2=$CHCH_2$	$PhCH_2$
B-1 / C- 335	HC≡CCH_2	$PhCH_2$
B-1 / C- 336	CH_3C≡CCH_2	$PhCH_2$
B-1 / C- 337	(cyclo-C_3H_5)CH_2	$PhCH_2$
B-1 / C- 338	$PhCH_2$	$PhCH_2$
B-1 / C- 339	$PhCH_2CH_2$	$PhCH_2$
B-1 / C- 340	(2-Cl-Ph)CH_2	$PhCH_2$
B-1 / C- 341	(3-Cl-Ph)CH_2	$PhCH_2$
B-1 / C- 342	(4-Cl-Ph)CH_2	$PhCH_2$
B-1 / C- 343	(2-CF_3-Ph)CH_2	$PhCH_2$
B-1 / C- 344	(3-CF_3-Ph)CH_2	$PhCH_2$
B-1 / C- 345	(4-CF_3-Ph)CH_2	$PhCH_2$
B-1 / C- 346	(2-CH_3O-Ph)CH_2	$PhCH_2$
B-1 / C- 347	(3-CH_3O-Ph)CH_2	$PhCH_2$
B-1 / C- 348	(4-CH_3O-Ph)CH_2	$PhCH_2$
B-1 / C- 349	CH_3O	$PhCH_2$
B-1 / C- 350	CH_3CH_2O	$PhCH_2$
B-1 / C- 351	n-C_3H_7O	$PhCH_2$

Compound	R^3	R^4
B-1 / C- 352	iso-C_3H_7O	$PhCH_2$
B-1 / C- 353	CH_2=$CHCH_2O$	$PhCH_2$
B-1 / C- 354	$CHCCH_2O$	$PhCH_2$
B-1 / C- 355	$PhCH_2O$	$PhCH_2$
B-1 / C- 356	PhO	$PhCH_2$
B-1 / C- 357	Ph	$PhCH_2$
B-1 / C- 358	2-Cl-Ph	$PhCH_2$
B-1 / C- 359	3-Cl-Ph	$PhCH_2$
B-1 / C- 360	4-Cl-Ph	$PhCH_2$
B-1 / C- 361	2-CF_3-Ph	$PhCH_2$
B-1 / C- 362	3-CF_3-Ph	$PhCH_2$
B-1 / C- 363	4-CF_3-Ph	$PhCH_2$
B-1 / C- 364	2-CH_3O-Ph	$PhCH_2$
B-1 / C- 365	3-CH_3O-Ph	$PhCH_2$
B-1 / C- 366	4-CH_3O-Ph	$PhCH_2$
B-1 / C- 367	4-CF_3O-Ph	$PhCH_2$
B-1 / C- 368	4-CF_3CH_2O-Ph	$PhCH_2$
B-1 / C- 369	4-(4-Cl-PhO)-Ph	$PhCH_2$
B-1 / C- 370	4-(4-CF_3-PhO)-Ph	$PhCH_2$
B-1 / C- 371	2,3-diCl-Ph	$PhCH_2$
B-1 / C- 372	1-Pyrrolyl	$PhCH_2$
B-1 / C- 373	1-Pyrazolyl	$PhCH_2$
B-1 / C- 374	1,2,4-Triazol-1-yl	$PhCH_2$
B-1 / C- 375	2-Thiazolyl	$PhCH_2$
B-1 / C- 376	1,3,4-Thiadiazol-2-yl	$PhCH_2$
B-1 / C- 377	CF_3CH_2	$PhCH_2$
B-1 / C- 378	$ClCH_2CH_2$	$PhCH_2$
B-1 / C- 379	$ClCH_2CH_2CH_2$	$PhCH_2$
B-1 / C- 380	$CH_3OCH_2CH_2$	$PhCH_2$
B-1 / C- 381	$CH_3CH_2OCH_2CH_2$	$PhCH_2$
B-1 / C- 382	$CH_3OCH_2CH_2CH_2$	$PhCH_2$
B-1 / C- 383	$C_2H_5OCH_2CH_2CH_2$	$PhCH_2$
B-1 / C- 384	n-$C_4H_9OCH_2CH_2CH_2$	$PhCH_2$

Compound	R^3	R^4
B-1 / C- 385	$(CH_3O)_2CHCH_2$	$PhCH_2$
B-1 / C- 386	$CH(CH_3)CH_2CH_2CH_2CH_2$	
B-1 / C- 387	$CH_2CHBrCH_2CH_2$	
B-1 / C- 388	$CH_2CH(OH)CH_2CH_2$	
B-1 / C- 389	$CH_2CH=CHCH_2$	
B-1 / C- 390	Ph	Ph
B-1 / C- 391	$CH_3SO_2OCH_2CH_2CH_2CH_2$	H
B-1 / C- 392	$CH_2CH_2CH_2CH_2CH_2$	
B-1 / C- 393	$CH_2CH_2OCH_2CH_2$	
B-1 / C- 394	$CH_2CH_2SCH_2CH_2$	
B-1 / C- 395	$CH_2CH_2NHCH_2CH_2$	
B-1 / C- 396	$CH_2CH_2N(CH_3)CH_2CH_2$	
B-1 / C- 397	$N=CHCH_2CH_2$	

Table 3

Compounds of the formula (Icc)



(Icc)

M = Na (compounds D-1-D-397) or K (compounds E-1-E-397)

Compound	R^3	R^4
D-1 / E-1	$CH_3CH=CHCH_2$	CH_3
D-1 / E-2	$CH_2=C(CH_3)CH_2$	CH_3
D-1 / E-3	$CH_2=CH(CH_3)CH$	CH_3
D-1 / E-4	$CH_2=CHCH_2CH_2$	CH_3
D-1 / E-5	$CH_3CH=C(CH_3)CH_2$	CH_3
D-1 / E-6	$CH(CH_3)HC=CHCH_3$	CH_3
D-1 / E-7	$C(CH_3)_2HC=CH_2$	CH_3
D-1 / E-8	$CH_2HC=C(CH_3)_2$	CH_3
D-1 / E-9	$CH_3CH=CHCH_2CH_2$	CH_3
D-1 / E- 10	$CH_2=CHCH_2CH_2CH_2$	CH_3
D-1 / E- 11	$CHC\equiv CCH_2$	CH_3
D-1 / E- 12	$CH_3C\equiv CCH_2$	CH_3
D-1 / E- 13	$HC\equiv CCH(CH_3)$	CH_3
D-1 / E- 14	$CH_3C\equiv CCH(CH_3)$	CH_3
D-1 / E- 15	cyclo-C_3H_5	CH_3
D-1 / E- 16	cyclo-C_5H_9	CH_3
D-1 / E- 17	cyclo-C_6H_{11}	CH_3
D-1 / E- 18	(cyclo-C_3H_5)CH_2	CH_3
D-1 / E- 19	(cyclo-C_5H_9)CH_2	CH_3
D-1 / E- 20	(cyclo-C_6H_{11})CH_2	CH_3
D-1 / E- 21	$PhCH_2$	CH_3
D-1 / E- 22	$PhCH(CH_3)$	CH_3

Compound	R^3	R^4
D-1 / E- 23	$PhC(CH_3)_2$	CH_3
D-1 / E- 24	$PhCH_2CH_2$	CH_3
D-1 / E- 25	$(2\text{-}F\text{-}Ph)CH_2$	CH_3
D-1 / E- 26	$(3\text{-}F\text{-}Ph)CH_2$	CH_3
D-1 / E- 27	$(4\text{-}F\text{-}Ph)CH_2$	CH_3
D-1 / E- 28	$(2\text{-}Cl\text{-}Ph)CH_2$	CH_3
D-1 / E- 29	$(3\text{-}Cl\text{-}Ph)CH_2$	CH_3
D-1 / E- 30	$(4\text{-}Cl\text{-}Ph)CH_2$	CH_3
D-1 / E- 31	$(2\text{-}CF_3\text{-}Ph)CH_2$	CH_3
D-1 / E- 32	$(3\text{-}CF_3\text{-}Ph)CH_2$	CH_3
D-1 / E- 33	$(4\text{-}CF_3\text{-}Ph)CH_2$	CH_3
D-1 / E- 34	$(2\text{-}CH_3O\text{-}Ph)CH_2$	CH_3
D-1 / E- 35	$(3\text{-}CH_3O\text{-}Ph)CH_2$	CH_3
D-1 / E- 36	$(4\text{-}CH_3O\text{-}Ph)CH_2$	CH_3
D-1 / E- 37	CH_3O	CH_3
D-1 / E- 38	CH_3CH_2O	CH_3
D-1 / E- 39	$n\text{-}C_3H_7O$	CH_3
D-1 / E- 40	$iso\text{-}C_3H_7O$	CH_3
D-1 / E- 41	$CH_2{=}CHCH_2O$	CH_3
D-1 / E- 42	$CH_2{=}C(CH_3)CH_2O$	CH_3
D-1 / E- 43	$CH_2{=}CHCH(CH_3)O$	CH_3
D-1 / E- 44	$CH_2{=}CHCH(CH_3)O$	CH_3
D-1 / E- 45	$CH_2{=}CHC(CH_3)_2O$	CH_3
D-1 / E- 46	$CH_3CH{=}CHCH_2O$	CH_3
D-1 / E- 47	$HC{\equiv}CCH_2O$	CH_3
D-1 / E- 48	$CH_3C{\equiv}CCH_2O$	CH_3
D-1 / E- 49	$HC{\equiv}CCH(CH_3)O$	CH_3
D-1 / E- 50	$CH_3O_2CCH(CH_3)O$	CH_3
D-1 / E- 51	$CH_3O_2CC(CH_3)_2O$	CH_3
D-1 / E- 52	$CH_3O_2CCH_2O$	CH_3
D-1 / E- 53	$PhCH_2O$	CH_3
D-1 / E- 54	PhO	CH_3
D-1 / E- 55	Ph	CH_3

Compound	R^3	R^4
D-1 / E- 56	2-F-Ph	CH_3
D-1 / E- 57	3-F-Ph	CH_3
D-1 / E- 58	4-F-Ph	CH_3
D-1 / E- 59	2-Cl-Ph	CH_3
D-1 / E- 60	3-Cl-Ph	CH_3
D-1 / E- 61	4-Cl-Ph	CH_3
D-1 / E- 62	2-Br-Ph	CH_3
D-1 / E- 63	3-Br-Ph	CH_3
D-1 / E- 64	4-Br-Ph	CH_3
D-1 / E- 65	2-I-Ph	CH_3
D-1 / E- 66	3-I-Ph	CH_3
D-1 / E- 67	4-I-Ph	CH_3
D-1 / E- 68	2-CF_3-Ph	CH_3
D-1 / E- 69	3-CF_3-Ph	CH_3
D-1 / E- 70	4-CF_3-Ph	CH_3
D-1 / E- 71	2-CH_3-Ph	CH_3
D-1 / E- 72	3-CH_3-Ph	CH_3
D-1 / E- 73	4-CH_3-Ph	CH_3
D-1 / E- 74	2-CH_3O-Ph	CH_3
D-1 / E- 75	3-CH_3O-Ph	CH_3
D-1 / E- 76	4-CH_3O-Ph	CH_3
D-1 / E- 77	2-NO_2-Ph	CH_3
D-1 / E- 78	3-NO_2-Ph	CH_3
D-1 / E- 79	4-NO_2-Ph	CH_3
D-1 / E- 80	2-CN-Ph	CH_3
D-1 / E- 81	3-CN-Ph	CH_3
D-1 / E- 82	4-CN-Ph	CH_3
D-1 / E- 83	2-CO_2Me-Ph	CH_3
D-1 / E- 84	3-CO_2Me-Ph	CH_3
D-1 / E- 85	4-CO_2Me-Ph	CH_3
D-1 / E- 86	2-CF_3O-Ph	CH_3
D-1 / E- 87	3-CF_3O-Ph	CH_3
D-1 / E- 88	4-CF_3O-Ph	CH_3

Compound	R^3	R^4
D-1 / E- 89	4-CF_3CH_2O-Ph	CH_3
D-1 / E- 90	4-(4-Cl-PhO)-Ph	CH_3
D-1 / E- 91	4-(4-CF_3-PhO)-Ph	CH_3
D-1 / E- 92	2,3-diCl-Ph	CH_3
D-1 / E- 93	2,4-diCl-Ph	CH_3
D-1 / E- 94	2,5-diCl-Ph	CH_3
D-1 / E- 95	2,6-diCl-Ph	CH_3
D-1 / E- 96	3,4-diCl-Ph	CH_3
D-1 / E- 97	3,5-diCl-Ph	CH_3
D-1 / E- 98	2-Pyridyl	CH_3
D-1 / E- 99	3-Pyridyl	CH_3
D-1 / E- 100	4-Pyridyl	CH_3
D-1 / E- 101	2-Pyrimidyl	CH_3
D-1 / E- 102	1-Pyrrolyl	CH_3
D-1 / E- 103	1-Pyrazolyl	CH_3
D-1 / E- 104	3-Pyrazolyl	CH_3
D-1 / E- 105	1,2,4-Triazol-1-yl	CH_3
D-1 / E- 106	1,2,4-Triazol-3-yl	CH_3
D-1 / E- 107	2-Furanyl	CH_3
D-1 / E- 108	3-Furanyl	CH_3
D-1 / E- 109	2-Thienyl	CH_3
D-1 / E- 110	3-Thienyl	CH_3
D-1 / E- 111	2-Thiazolyl	CH_3
D-1 / E- 112	1,3,4-Thiadiazol-2-yl	CH_3
D-1 / E- 113	3-Isoxazolyl	CH_3
D-1 / E- 114	CF_3CH_2	CH_3
D-1 / E- 115	$ClCH_2CH_2$	CH_3
D-1 / E- 116	$ClCH_2CH_2CH_2$	CH_3
D-1 / E- 117	$CH_3OCH_2CH_2$	CH_3
D-1 / E- 118	$CH_3CH_2OCH_2CH_2$	CH_3
D-1 / E- 119	$CH_3OCH_2CH_2CH_2$	CH_3
D-1 / E- 120	$C_2H_5OCH_2CH_2CH_2$	CH_3
D-1 / E- 121	n-$C_4H_9OCH_2CH_2CH_2$	CH_3

Compound	R^3	R^4
D-1 / E- 122	$(CH_3O)_2CHCH_2$	CH_3
D-1 / E- 123	$(CH_3O)_2C=CH_2$	CH_3
D-1 / E- 124	$(CH_3O_2)C=CH(CH_3)$	CH_3
D-1 / E- 125	$CH_3O_2CC(CH_3)_2$	CH_3
D-1 / E- 126	$NCCH_2$	CH_3
D-1 / E- 127	$NC(CH_3)(iso\text{-}C_3H_7)C$	CH_3
D-1 / E- 128	$(1\text{-pyrrolidinyl})CH_2CH_2$	C_2H_5
D-1 / E- 129	$CH_2=CHCH_2$	C_2H_5
D-1 / E- 130	$CHC=CH_2$	C_2H_5
D-1 / E- 131	$CH_3C\equiv CCH_2$	C_2H_5
D-1 / E- 132	$(cyclo\text{-}C_3H_5)CH_2$	C_2H_5
D-1 / E- 133	$PhCH_2$	C_2H_5
D-1 / E- 134	$PhCH_2CH_2$	C_2H_5
D-1 / E- 135	$(2\text{-Cl-Ph})CH_2$	C_2H_5
D-1 / E- 136	$(3\text{-Cl-Ph})CH_2$	C_2H_5
D-1 / E- 137	$(4\text{-Cl-Ph})CH_2$	C_2H_5
D-1 / E- 138	$(2\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
D-1 / E- 139	$(3\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
D-1 / E- 140	$(4\text{-}CF_3\text{-Ph})CH_2$	C_2H_5
D-1 / E- 141	$(2\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
D-1 / E- 142	$(3\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
D-1 / E- 143	$(4\text{-}CH_3O\text{-Ph})CH_2$	C_2H_5
D-1 / E- 144	CH_3O	C_2H_5
D-1 / E- 145	CH_3CH_2O	C_2H_5
D-1 / E- 146	$n\text{-}C_3H_7O$	C_2H_5
D-1 / E- 147	$iso\text{-}C_3H_7O$	C_2H_5
D-1 / E- 148	$CH_2=CHCH_2O$	C_2H_5
D-1 / E- 149	$HC\equiv CCH_2O$	C_2H_5
D-1 / E- 150	$PhCH_2O$	C_2H_5
D-1 / E- 151	PhO	C_2H_5
D-1 / E- 152	Ph	C_2H_5
D-1 / E- 153	2-Cl-Ph	C_2H_5
D-1 / E- 154	3-Cl-Ph	C_2H_5

Compound	R^3	R^4
D-1 / E- 155	4-Cl-Ph	C_2H_5
D-1 / E- 156	2-CF_3-Ph	C_2H_5
D-1 / E- 157	3-CF_3-Ph	C_2H_5
D-1 / E- 158	4-CF_3-Ph	C_2H_5
D-1 / E- 159	2-CH_3O-Ph	C_2H_5
D-1 / E- 160	3-CH_3O-Ph	C_2H_5
D-1 / E- 161	4-CH_3O-Ph	C_2H_5
D-1 / E- 162	4-CF_3O-Ph	C_2H_5
D-1 / E- 163	4-CF_3CH_2O-Ph	C_2H_5
D-1 / E- 164	4-(4-Cl-PhO)-Ph	C_2H_5
D-1 / E- 165	4-(4-CF_3-PhO)-Ph	C_2H_5
D-1 / E- 166	2,3-diCl-Ph	C_2H_5
D-1 / E- 167	1-Pyrrolyl	C_2H_5
D-1 / E- 168	1-Pyrazolyl	C_2H_5
D-1 / E- 169	1,2,4-Triazol-1-yl	C_2H_5
D-1 / E- 170	2-Thiazolyl	C_2H_5
D-1 / E- 171	1,3,4-Thiadiazol-2-yl	C_2H_5
D-1 / E- 172	$CH_3O_2CCH_2$	C_2H_5
D-1 / E- 173	$CH_3O_2CCH(CH_3)$	C_2H_5
D-1 / E- 174	$NCCH_2$	n-C_3H_7
D-1 / E- 175	CH_2=$CHCH_2$	iso-C_3H_7
D-1 / E- 176	HC≡CCH_2	iso-C_3H_7
D-1 / E- 177	CH_3C≡CCH_2	iso-C_3H_7
D-1 / E- 178	(cyclo-C_3H_5)CH_2	iso-C_3H_7
D-1 / E- 179	$PhCH_2$	iso-C_3H_7
D-1 / E- 180	$PhCH_2CH_2$	iso-C_3H_7
D-1 / E- 181	(2-Cl-Ph)CH_2	iso-C_3H_7
D-1 / E- 182	(3-Cl-Ph)CH_2	iso-C_3H_7
D-1 / E- 183	(4-Cl-Ph)CH_2	iso-C_3H_7
D-1 / E- 184	(2-CF_3-Ph)CH_2	iso-C_3H_7
D-1 / E- 185	(3-CF_3-Ph)CH_2	iso-C_3H_7
D-1 / E- 186	(4-CF_3-Ph)CH_2	iso-C_3H_7
D-1 / E- 187	(2-CH_3O-Ph)CH_2	iso-C_3H_7

Compound	R^3	R^4
D-1 / E- 188	(3-CH_3O-Ph)CH_2	iso-C_3H_7
D-1 / E- 189	(4-CH_3O-Ph)CH_2	iso-C_3H_7
D-1 / E- 190	CH_3O	iso-C_3H_7
D-1 / E- 191	CH_3CH_2O	iso-C_3H_7
D-1 / E- 192	n-C_3H_7O	iso-C_3H_7
D-1 / E- 193	iso-C_3H_7O	iso-C_3H_7
D-1 / E- 194	CH_2=$CHCH_2O$	iso-C_3H_7
D-1 / E- 195	HC≡CCH_2O	iso-C_3H_7
D-1 / E- 196	$PhCH_2O$	iso-C_3H_7
D-1 / E- 197	PhO	iso-C_3H_7
D-1 / E- 198	Ph	iso-C_3H_7
D-1 / E- 199	2-Cl-Ph	iso-C_3H_7
D-1 / E- 200	3-Cl-Ph	iso-C_3H_7
D-1 / E- 201	4-Cl-Ph	iso-C_3H_7
D-1 / E- 202	2-CF_3-Ph	iso-C_3H_7
D-1 / E- 203	3-CF_3-Ph	iso-C_3H_7
D-1 / E- 204	4-CF_3-Ph	iso-C_3H_7
D-1 / E- 205	2-CH_3O-Ph	iso-C_3H_7
D-1 / E- 206	3-CH_3O-Ph	iso-C_3H_7
D-1 / E- 207	4-CH_3O-Ph	iso-C_3H_7
D-1 / E- 208	4-CF_3O-Ph	iso-C_3H_7
D-1 / E- 209	4-CF_3CH_2O-Ph	iso-C_3H_7
D-1 / E- 210	4-(4-Cl-PhO)-Ph	iso-C_3H_7
D-1 / E- 211	4-(4-CF_3-PhO)-Ph	iso-C_3H_7
D-1 / E- 212	2,3-diCl-Ph	iso-C_3H_7
D-1 / E- 213	1-Pyrrolyl	iso-C_3H_7
D-1 / E- 214	1-Pyrazolyl	iso-C_3H_7
D-1 / E- 215	1,2,4-Triazol-1-yl	iso-C_3H_7
D-1 / E- 216	2-Thiazolyl	iso-C_3H_7
D-1 / E- 217	1,3,4-Thiadiazol-2-yl	iso-C_3H_7
D-1 / E- 218	CF_3CH_2	iso-C_3H_7
D-1 / E- 219	$ClCH_2CH_2$	iso-C_3H_7
D-1 / E- 220	$ClCH_2CH_2CH_2$	iso-C_3H_7

Compound	R^3	R^4
D-1 / E- 221	$CH_3OCH_2CH_2$	iso-C_3H_7
D-1 / E- 222	$CH_3CH_2OCH_2CH_2$	iso-C_3H_7
D-1 / E- 223	$CH_3OCH_2CH_2CH_2$	iso-C_3H_7
D-1 / E- 224	$C_2H_5OCH_2CH_2CH_2$	iso-C_3H_7
D-1 / E- 225	n-$C_4H_9OCH_2CH_2CH_2$	iso-C_3H_7
D-1 / E- 226	$(CH_3O)_2CHCH_2$	iso-C_3H_7
D-1 / E- 227	$CH_3O_2CCH_2$	iso-C_3H_7
D-1 / E- 228	$CH_3O_2CCH(CH_3)$	iso-C_3H_7
D-1 / E- 229	$NCCH_2$	iso-C_3H_7
D-1 / E- 230	$NC(CH_3)$(iso-C_3H_7)	tert-C_4H_9
D-1 / E- 231	$CH_2=CHCH_2$	tert-C_4H_9
D-1 / E- 232	$CHCCH_2$	tert-C_4H_9
D-1 / E- 233	CH_3CCCH_2	tert-C_4H_9
D-1 / E- 234	(cyclo-C_3H_5)CH_2	tert-C_4H_9
D-1 / E- 235	$PhCH_2$	tert-C_4H_9
D-1 / E- 236	$PhCH_2CH_2$	tert-C_4H_9
D-1 / E- 237	(2-Cl-Ph)CH_2	tert-C_4H_9
D-1 / E- 238	(3-Cl-Ph)CH_2	tert-C_4H_9
D-1 / E- 239	(4-Cl-Ph)CH_2	tert-C_4H_9
D-1 / E- 240	(2-CF_3-Ph)CH_2	tert-C_4H_9
D-1 / E- 241	(3-CF_3-Ph)CH_2	tert-C_4H_9
D-1 / E- 242	(4-CF_3-Ph)CH_2	tert-C_4H_9
D-1 / E- 243	(2-CH_3O-Ph)CH_2	tert-C_4H_9
D-1 / E- 244	(3-CH_3O-Ph)CH_2	tert-C_4H_9
D-1 / E- 245	(4-CH_3O-Ph)CH_2	tert-C_4H_9
D-1 / E- 246	CH_3O	tert-C_4H_9
D-1 / E- 247	CH_3CH_2O	tert-C_4H_9
D-1 / E- 248	n-C_3H_7O	tert-C_4H_9
D-1 / E- 249	iso-C_3H_7O	tert-C_4H_9
D-1 / E- 250	$CH_2=CHCH_2O$	tert-C_4H_9
D-1 / E- 251	$HC\equiv CCH_2O$	tert-C_4H_9
D-1 / E- 252	$PhCH_2O$	tert-C_4H_9
D-1 / E- 253	PhO	tert-C_4H_9

Compound	R^3	R^4
D-1 / E- 254	Ph	tert-C_4H_9
D-1 / E- 255	2-Cl-Ph	tert-C_4H_9
D-1 / E- 256	3-Cl-Ph	tert-C_4H_9
D-1 / E- 257	4-Cl-Ph	tert-C_4H_9
D-1 / E- 258	2-CF_3-Ph	tert-C_4H_9
D-1 / E- 259	3-CF_3-Ph	tert-C_4H_9
D-1 / E- 260	4-CF_3-Ph	tert-C_4H_9
D-1 / E- 261	2-CH_3O-Ph	tert-C_4H_9
D-1 / E- 262	3-CH_3O-Ph	tert-C_4H_9
D-1 / E- 263	4-CH_3O-Ph	tert-C_4H_9
D-1 / E- 264	4-CF_3O-Ph	tert-C_4H_9
D-1 / E- 265	4-CF_3CH_2O-Ph	tert-C_4H_9
D-1 / E- 266	4-(4-Cl-PhO)-Ph	tert-C_4H_9
D-1 / E- 267	4-(4-CF_3-PhO)-Ph	tert-C_4H_9
D-1 / E- 268	2,3-diCl-Ph	tert-C_4H_9
D-1 / E- 269	1-Pyrrolyl	tert-C_4H_9
D-1 / E- 270	1-Pyrazolyl	tert-C_4H_9
D-1 / E- 271	1,2,4-Triazol-1-yl	tert-C_4H_9
D-1 / E- 272	2-Thiazolyl	tert-C_4H_9
D-1 / E- 273	1,3,4-Thiadiazol-2-yl	tert-C_4H_9
D-1 / E- 274	$CH_3O_2CCH_2$	tert-C_4H_9
D-1 / E- 275	$CH_3O_2CCH(CH_3)$	tert-C_4H_9
D-1 / E- 276	$NCCH_2$	tert-C_4H_9
D-1 / E- 277	$NC(CH_3)$(iso-C_3H_7)C	CH_2=$CHCH_2$
D-1 / E- 278	CH_2=$CHCH_2$	CH_2=$CHCH_2$
D-1 / E- 279	HC≡CCH_2	CH_2=$CHCH_2$
D-1 / E- 280	CH_3CCCH_2	CH_2=$CHCH_2$
D-1 / E- 281	(cyclo-C_3H_5)CH_2	CH_2=$CHCH_2$
D-1 / E- 282	$PhCH_2$	CH_2=$CHCH_2$
D-1 / E- 283	$PhCH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 284	(2-Cl-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 285	(3-Cl-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 286	(4-Cl-Ph)CH_2	CH_2=$CHCH_2$

Compound	R^3	R^4
D-1 / E- 287	(2-CF_3-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 288	(3-CF_3-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 289	(4-CF_3-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 290	(2-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 291	(3-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 292	(4-CH_3O-Ph)CH_2	CH_2=$CHCH_2$
D-1 / E- 293	CH_3O	CH_2=$CHCH_2$
D-1 / E- 294	CH_3CH_2O	CH_2=$CHCH_2$
D-1 / E- 295	n-C_3H_7O	CH_2=$CHCH_2$
D-1 / E- 296	iso-C_3H_7O	CH_2=$CHCH_2$
D-1 / E- 297	CH_2=$CHCH_2O$	CH_2=$CHCH_2$
D-1 / E- 298	$CHCCH_2O$	CH_2=$CHCH_2$
D-1 / E- 299	$PhCH_2O$	CH_2=$CHCH_2$
D-1 / E- 300	PhO	CH_2=$CHCH_2$
D-1 / E- 301	Ph	CH_2=$CHCH_2$
D-1 / E- 302	2-Cl-Ph	CH_2=$CHCH_2$
D-1 / E- 303	3-Cl-Ph	CH_2=$CHCH_2$
D-1 / E- 304	4-Cl-Ph	CH_2=$CHCH_2$
D-1 / E- 305	2-CF_3-Ph	CH_2=$CHCH_2$
D-1 / E- 306	3-CF_3-Ph	CH_2=$CHCH_2$
D-1 / E- 307	4-CF_3-Ph	CH_2=$CHCH_2$
D-1 / E- 308	2-CH_3O-Ph	CH_2=$CHCH_2$
D-1 / E- 309	3-CH_3O-Ph	CH_2=$CHCH_2$
D-1 / E- 310	4-CH_3O-Ph	CH_2=$CHCH_2$
D-1 / E- 311	4-CF_3O-Ph	CH_2=$CHCH_2$
D-1 / E- 312	4-CF_3CH_2O-Ph	CH_2=$CHCH_2$
D-1 / E- 313	4-(4-Cl-PhO)-Ph	CH_2=$CHCH_2$
D-1 / E- 314	4-(4-CF_3-PhO)-Ph	CH_2=$CHCH_2$
D-1 / E- 315	2,3-diCl-Ph	CH_2=$CHCH_2$
D-1 / E- 316	1-Pyrrolyl	CH_2=$CHCH_2$
D-1 / E- 317	1-Pyrazolyl	CH_2=$CHCH_2$
D-1 / E- 318	1,2,4-Triazol-1-yl	CH_2=$CHCH_2$
D-1 / E- 319	2-Thiazolyl	CH_2=$CHCH_2$

Compound	R^3	R^4
D-1 / E- 320	1,3,4-Thiadiazol-2-yl	CH_2=$CHCH_2$
D-1 / E- 321	CF_3CH_2	CH_2=$CHCH_2$
D-1 / E- 322	$ClCH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 323	$ClCH_2CH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 324	$CH_3OCH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 325	$CH_3CH_2OCH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 326	$CH_3OCH_2CH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 327	$C_2H_5OCH_2CH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 328	n-C4$H_9OCH_2CH_2CH_2$	CH_2=$CHCH_2$
D-1 / E- 329	$(CH_3O)_2CHCH_2$	CH_2=$CHCH_2$
D-1 / E- 330	$CH_3O_2CCH_2$	CH_2=$CHCH_2$
D-1 / E- 331	$CH_3O_2CCH(CH_3)$	CH_2=$CHCH_2$
D-1 / E- 332	$NCCH_2$	CH_2=$CHCH_2$
D-1 / E- 333	$NC(CH_3)$(iso-C_3H_7)C	$PhCH_2$
D-1 / E- 334	CH_2=$CHCH_2$	$PhCH_2$
D-1 / E- 335	HC≡CCH_2	$PhCH_2$
D-1 / E- 336	CH_3C≡CCH_2	$PhCH_2$
D-1 / E- 337	(cyclo-C_3H_5)CH_2	$PhCH_2$
D-1 / E- 338	$PhCH_2$	$PhCH_2$
D-1 / E- 339	$PhCH_2CH_2$	$PhCH_2$
D-1 / E- 340	(2-Cl-Ph)CH_2	$PhCH_2$
D-1 / E- 341	(3-Cl-Ph)CH_2	$PhCH_2$
D-1 / E- 342	(4-Cl-Ph)CH_2	$PhCH_2$
D-1 / E- 343	(2-CF_3-Ph)CH_2	$PhCH_2$
D-1 / E- 344	(3-CF_3-Ph)CH_2	$PhCH_2$
D-1 / E- 345	(4-CF_3-Ph)CH_2	$PhCH_2$
D-1 / E- 346	(2-CH_3O-Ph)CH_2	$PhCH_2$
D-1 / E- 347	(3-CH_3O-Ph)CH_2	$PhCH_2$
D-1 / E- 348	(4-CH_3O-Ph)CH_2	$PhCH_2$
D-1 / E- 349	CH_3O	$PhCH_2$
D-1 / E- 350	CH_3CH_2O	$PhCH_2$
D-1 / E- 351	n-C_3H_7O	$PhCH_2$
D-1 / E- 352	iso-C_3H_7O	$PhCH_2$

Compound	R^3	R^4
D-1 / E- 353	CH_2=$CHCH_2O$	$PhCH_2$
D-1 / E- 354	$CHCCH_2O$	$PhCH_2$
D-1 / E- 355	$PhCH_2O$	$PhCH_2$
D-1 / E- 356	PhO	$PhCH_2$
D-1 / E- 357	Ph	$PhCH_2$
D-1 / E- 358	2-Cl-Ph	$PhCH_2$
D-1 / E- 359	3-Cl-Ph	$PhCH_2$
D-1 / E- 360	4-Cl-Ph	$PhCH_2$
D-1 / E- 361	2-CF_3-Ph	$PhCH_2$
D-1 / E- 362	3-CF_3-Ph	$PhCH_2$
D-1 / E- 363	4-CF_3-Ph	$PhCH_2$
D-1 / E- 364	2-CH_3O-Ph	$PhCH_2$
D-1 / E- 365	3-CH_3O-Ph	$PhCH_2$
D-1 / E- 366	4-CH_3O-Ph	$PhCH_2$
D-1 / E- 367	4-CF_3O-Ph	$PhCH_2$
D-1 / E- 368	4-CF_3CH_2O-Ph	$PhCH_2$
D-1 / E- 369	4-(4-Cl-PhO)-Ph	$PhCH_2$
D-1 / E- 370	4-(4-CF_3-PhO)-Ph	$PhCH_2$
D-1 / E- 371	2,3-diCl-Ph	$PhCH_2$
D-1 / E- 372	1-Pyrrolyl	$PhCH_2$
D-1 / E- 373	1-Pyrazolyl	$PhCH_2$
D-1 / E- 374	1,2,4-Triazol-1-yl	$PhCH_2$
D-1 / E- 375	2-Thiazolyl	$PhCH_2$
D-1 / E- 376	1,3,4-Thiadiazol-2-yl	$PhCH_2$
D-1 / E- 377	CF_3CH_2	$PhCH_2$
D-1 / E- 378	$ClCH_2CH_2$	$PhCH_2$
D-1 / E- 379	$ClCH_2CH_2CH_2$	$PhCH_2$
D-1 / E- 380	$CH_3OCH_2CH_2$	$PhCH_2$
D-1 / E- 381	$CH_3CH_2OCH_2CH_2$	$PhCH_2$
D-1 / E- 382	$CH_3OCH_2CH_2CH_2$	$PhCH_2$
D-1 / E- 383	$C_2H_5OCH_2CH_2CH_2$	$PhCH_2$
D-1 / E- 384	n-$C_4H_9OCH_2CH_2CH_2$	$PhCH_2$
D-1 / E- 385	$(CH_3O)_2CHCH_2$	$PhCH_2$

Compound	R^3	R^4
D-1 / E- 386	$CH(CH_3)CH_2CH_2CH_2CH_2$	
D-1 / E- 387	$CH_2CHBrCH_2CH_2$	
D-1 / E- 388	$CH_2CH(OH)CH_2CH_2$	
D-1 / E- 389	$CH_2CH=CHCH_2$	
D-1 / E- 390	Ph	Ph
D-1 / E- 391	$CH_3SO_2OCH_2CH_2CH_2CH_2$	H
D-1 / E- 392	$CH_2CH_2CH_2CH_2CH_2$	
D-1 / E- 393	$CH_2CH_2OCH_2CH_2$	
D-1 / E- 394	$CH_2CH_2SCH_2CH_2$	
D-1 / E- 395	$CH_2CH_2NHCH_2CH_2$	
D-1 / E- 396	$CH_2CH_2N(CH_3)CH_2CH_2$	
D-1 / E- 397	$N=CHCH_2CH_2$	

B. Formulation examples

a) A dust is obtained by mixing 10 parts by weight of active compound and 90 parts by weight of talc as inert material and comminuting the mixture in a hammer mill.

b) A wettable powder which is readily dispersible in water is obtained by mixing 25 parts by weight of active compound, 65 parts by weight of kaolin-containing quartz as inert material, 10 parts by weight of potassium lignosulfonate and 1 part by weight of sodium oleoylmethyltaurinate as wetter and dispersant and grinding the mixture in a pinned-disk mill.

c) A dispersion concentrate which is readily dispersible in water is prepared by mixing 40 parts by weight of active compound with 7 parts by weight of a sulfo-succinic monoester, 2 parts by weight of a sodium lignosulfonate and 51 parts by

weight of water and grinding the mixture in a ball mill to a fineness of below 5 microns.

d) An emulsifiable concentrate can be prepared from 15 parts by weight of active compound, 75 parts by weight of cyclohexane as solvent and 10 parts by weight of oxyethylated nonylphenol (10 EO) as emulsifier.

e) Granules can be prepared from 2 to 15 parts by weight of active compound and an inert granule carrier material such as attapulgite, pumice granules and/or quartz sand. It is expedient to use a suspension of the wettable powder of example b) with a solids content of 30%, which is sprayed onto the surface of attapulgite granules, and these are dried and mixed intimately. The wettable powder amounts to approx. 5% by weight and the inert carrier material to approx. 95% by weight of the finished granules.

C. Biological examples

Example 1

Germinated field bean seeds (Vicia faba) with radicles are transferred into brown glass bottles filled with tap water and subsequently populated with approximately 100 black bean aphids (Aphis fabae). Plants and aphids are then dipped for 5 seconds into an aqueous solution of the formulated compound to be examined. After the solution has run off, plant and animals are stored in a climatized chamber (16 hours of light/day, 25°C, 40-60% relative atmospheric humidity). After 3 and 6 days of storage, the effect of the compound on the aphids is determined. At a concentration of 300 ppm (based on the concentration of active compound), the compounds of the invention cause 90-100% mortality among the aphids.

Example 2

Germinated field bean seeds (Vicia faba) with radicals are transferred into brown glass bottles filled with tap water. Four milliliters of an aqueous solution of the formulated compound to be examined are pipetted into the brown glass bottle. The field bean is then heavily infested with about 100 black bean aphids (Aphis fabae). Plant and aphids are then stored in a climatized chamber (16 hours of light/day, 25°C, 40-60% relative atmospheric humidity). After 3 and 6 days of storage, the root-systemic effect of the compound on the aphids is determined. At a concentration of 300 ppm (based on the concentration of active compound), the compounds of the invention cause 90-100% mortality among the aphids through root-systemic activity.